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# Land Application of Wastewater and State Water Law: State Analyses Volume II

**Wisconsin Univ, Madison Law School**

Prepared for

**Robert S Kerr Environmental Research Lab, Ada, OK**

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# Land Application of Wastewater and State Water Law

## State Analyses
## Volume II

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This research project was undertaken with the overall objective of analyzing state water rights law in order to determine its possible impact on systems of land application of wastewater. It was determined that most states do not have regulations specifically controlling land application of wastewater, and that an analysis would have to be undertaken of basic state water law principles which, for the most part, have been developed with entirely different uses of water in mind. There is a basic distinction between the "riparian" states of the East, which emphasize the right of each riparian landowner along a watercourse to the use of the water, and the "appropriation" states of the West, which emphasize that the right inures to the prior user of the water. For the most part, state water rights law was found to contain enough flexibility, through its emphasis on encouraging "reasonable" uses of water, to enable land application systems to operate free from legal uncertainty.

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# LAND APPLICATION OF WASTEWATER AND STATE WATER LAW: STATE ANALYSES

## Volume II

by

Donald W. Large
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Contract Number EPA-IAG-D5-0799

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# FOREWORD

The Environmental Protection Agency was established to coordinate administration of the major Federal programs designed to protect the quality of our environment.

An important part of the agency's effort involves the search for information about environmental problems, management techniques and new technologies through which optimum use of the nation's land and water resources can be assured and the threat pollution poses to the welfare of the American people can be minimized.

EPA's Office of Research and Development conducts this search through a nationwide network of research facilities. As one of these facilities, the Robert S. Kerr Environmental Research Laboratory is responsible for the management of programs including the development and demonstration of soil and other natural systems for the treatment and management of municipal wastewaters.

Although land application of municipal wastewaters has been practiced for years, there has been a growing and widespread interest in this practice in recent years. The use of land application received major impetus with the passage of the 1972 amendments to the Federal Water Pollution Control Act. Subsequent revisions in the Environmental Protection Agency construction grants regulations made the use of land application mandatory if it was the most cost effective alternative and satisfied other applicable requirements. As land application became more widespread, a growing need developed to define the legal aspects of this technology, particularly with respect to the water rights laws of the various states. The purpose of this report is to satisfy this need.

This report contributes to the knowledge essential if the EPA is to meet the requirements of environmental laws that it establishes and enforce pollution control standards which are reasonable, cost effective and provide adequate protection for the American public.

William C Galegar

William C. Galegar
Director
Robert S. Kerr Environmental
Research Laboratory

# PREFACE

Land application of wastewater for irrigation and other purposes is becoming an increasingly popular method of sewage treatment and disposal. In a time of intensified concern with water quality, care must be taken to insure that land application systems are planned and operated consistently with applicable water quality standards.

While Federal laws and regulations pertaining to preservation of water resources will have application to land application systems, another source of legal control not yet intensively studied is the water law policies of the states in which land application systems are being or will be developed. While some states have specific regulations pertaining to land application, most do not. In this latter group of states, it becomes necessary to analyze the possible impacts a land application system might have on the waters of the state, and to determine general water law framework.

The purpose of this report is to provide an in-depth analysis of the water rights law in several states applicable to land application of wastewater. Analyses are made in each state of the laws concerned with natural watercourses, surface waters, and groundwater. An identification is made of those particular aspects of the law relating to each type of water that may influence treatment system design and operation. References will be made throughout to the overview of water law doctrines and precautions suggested for land application system operators to assist in avoiding liability found in Volume I of this report, "Land Application of Wastewater and State Water Law: An Overview." It is intended that this report, with its in-depth analysis of state water rights laws, shall serve as an aftermath to the preceding general study.

# ABSTRACT

This research project was undertaken with the overall objective of analyzing state water rights law in order to determine its possible impact on systems of land application of wastewater.

It was determined that most states do not have regulations specifically controlling land application of wastewater, and that an analysis would have to be undertaken of basic state water law principles which, for the most part, have been developed with entirely different uses of water in mind.

Several basic dichotomies were noted which could have some impact on the treatment of land application systems in different locations. There is a basic distinction between the "riparian" states of the East, which emphasize the right of each riparian landowner along a watercourse to the use of the water, and the "appropriation" states of the West, which emphasize that the right inures to the prior user of the water. In addition, most states in both the riparian and appropriation categories distinguish between "natural watercourses," "surface water," and "groundwater," with different legal considerations and results frequently occurring in different categories of water within the same state.

Occasional abstract legal requirements of absolute purity of waters were found which, if literally applied, could pose adverse implications for any innovative uses of water, including land application. For the most part, state water rights law was found to contain enough flexibility, through its emphasis on encouraging "reasonable" uses of water, to enable land application systems to operate free from legal uncertainty.

This report was submitted in fulfillment of Contract No. EPA-IAG-D5-0799 by the Economics, Statistics, and Cooperatives Service (formerly Economic Research Service), U.S. Department of Agriculture, under the sponsorship of the U.S. Environmental Protection Agency. The report covers the period June 30, 1975 to September 30, 1977, and work was completed as of June 30, 1978. Research for the report was performed at the School of Natural Resources and Law School, University of Wisconsin-Madison, pursuant to Cooperative Agreement No. 12-17-06-8-1423-X between the University of Wisconsin and the Economics, Statistics, and Cooperatives Service, U.S. Department of Agriculture.

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# SECTION 1

# INTRODUCTION

The purpose of this report is to define the legal questions which pertain to land application of wastewater in the context of private water rights law, explain the riparian and appropriation theories, which are the two basic theories of water law prevalent in the United States, identify the particular aspects of each theory that influence treatment system design and operation, and analyze the private water rights laws of selected states in relationship to land application systems.

Volume I of this report dealt with the general legal problems that might be encountered by land application systems under state water rights laws. A general description of water rights law was provided, including an analysis of those particular parts of the riparian and appropriation doctrines most likely to be relevant to the operation of land application systems.

In contrast to the general overview provided by Volume I, Volume II provides an in-depth analysis of the water laws of selected states which were seen as being of unique importance or as representative of a larger group of states in a particular geographical area. The criteria relevant to the choice of states for analysis included the need to contrast: (1) riparian theory and appropriation theory states; (2) states with administrative regulations applicable to land application and states without such regulations; (3) industrialized states and predominantly rural or agrarian states; and (4) water-rich states and water-scarce states within those following both the riparian and appropriation doctrines.

With these criteria in mind, the following Eastern States, which adhere to the riparian theory, were selected for analysis: Arkansas, Florida, Georgia, Kentucky, Massachusetts, Michigan, Missouri, New York, Ohio, Pennsylvania, Tennessee, and Wisconsin. Arizona, California, Colorado, Kansas, and Texas were chosen as representative of the Western States, or those following the appropriation theory.

Of the Eastern States, Michigan, New York, Ohio, and Pennsylvania were included to represent the northeastern industrial complex with its heavy usage of water. Arkansas, Florida, Georgia, and Tennessee were included as representative of Southeastern States. Of this group, Florida and Georgia are more water-plentiful and Arkansas and Tennessee, while not arid in the western sense, are less water-plentiful, interior states. Wisconsin was included because of its extensive water law and its position, along with Michigan, as a leader in development of water law doctrines in the Eastern States. Finally, Kentucky and Missouri were included later as the project developed because of certain unique features in their water law which was not found in the other Eastern States already examined.

With regard to the Western States, California and Colorado are the traditional sources of western water law and are divergent on a number of important points. California is more representative of the relatively water-plentiful far Western States and Colorado more representative of the arid interior states. Texas was included because of an extensive statutory water law structure that differs significantly from either the California or Colorado models and Arizona was included because of its existing land application regulations. Kansas has an unusual historical background, combining riparian and appropriation theories in a way not found in other Western States.

The legal analysis in this report is primarily concerned with the problems that may be encountered in the final--or drainage--state of land application systems. Drainage patterns can be affected by many factors, including land preparation, methods of wastewater application, soil characteristics, slope, spacing of irrigation equipment, cover crops, buffer zones, and climatic conditions. But in any situation, the land application of wastewaters--much of which had previously been discharged into natural watercourses--will have several effects.

First, land application will alter the flow pattern of the body of water into which wastewater would have been discharged in the absence of the land application system. The alteration may increase the quality of the body of water in question, while diminishing the quantity of its flow.

Second, land application may cause diversion of some surface waters, because wastes now being processed for on-land application may previously have been carried away by the flow of surface waters.

Third, trace contaminants may remain on the land after application, and may either seep into underlying groundwater supplies, drain into a lake or stream, or be carried off the application site with surface waters.

These varying effects will raise potential legal problems under the water law of each state where a land application system is located. Analysis is complicated by the fact that most states have different legal structures for different classifications of water, with the result that apparently similar legal questions can receive widely divergent answers, depending on whether the affected water is characterized as a natural watercourse, surface water, or groundwater.

In addition, other divisions further complicate the subject. The most important is the distinction, occurring originally in the natural watercourse area, between the riparian theory prevalent in the Eastern States and the appropriation theory that has either supplanted or wholly replaced the riparian theory in 17 contiguous Western States and Alaska.

## SECTION 2

## CONCLUSIONS

Hostility to land application systems was not discovered in any of the states' laws analyzed. There were, however, occasional uncertainties in several states caused by the lack of statutes, regulations, or judicial decisions involving land application.

As was developed in Volume I of this report, the position of land application systems was strongest in the eastern riparian theory states. However, considerable variation existed between the states in some matters, particularly with regard to administrative regulations pertaining to on-land application.

Insofar as the states' basic water rights laws were concerned--without considering administrative regulations--probably the most favorable Eastern States from the perspective of land application systems are Florida, Pennsylvania, and Ohio. Each of these states displays a receptiveness toward innovative uses of water, even in situations where those uses might interfere to some degree, whether through diversion or pollution, with pre-existing uses. No riparian state could be called unfavorable, however. Perhaps the most possible problems would be found in Georgia, which has a very broad rule of liability and does not recognize the balancing of equities defense, and in Wisconsin, which allows an unusually broad class of people to institute litigation for alleged harm to water supplies.

On the other hand, Georgia and Wisconsin have favorable administrative regulations, specifically governing land application systems with a minimum of uncertainty in their scope. Ohio has a few very vague regulations, which could either present no problems or be a serious impediment to operating on-land application systems, depending on how they are interpreted in each particular case. Arkansas reflects the same contrast as does Ohio, with even more divergency between its favorable underlying water law and its very restrictive regulations.

Finally, there are some important Eastern States, such as Massachusetts, that have no applicable administrative regulations. Such a state, despite a favorable basic water law, must of necessity remain somewhat uncertain because of doubt as to how that basic water law would be applied to land application systems.

The western appropriation theory states were generally less favorable to land application than the Eastern States. This was primarily because the appropriation theory recognizes enforceable rights in all types of waters, whereas under riparian theory, such rights are usually limited to waters in watercourses. There was, however, significant variation between the particular states.

California, for example, was found to have the most favorable underlying water law of any Western State. Its regulations, while not unduly restrictive, are voluminous and complex, but the basic posture toward land application remains very favorable. Colorado, by way of contrast, has a much less favorable water law and significantly more stringent regulations. Arizona falls somewhere in between the two extremes, as it has produced a clear and very favorable set of regulations despite an underlying water law base little better than Colorado's.

# SECTION 3

# RIPARIAN STATES

## ARKANSAS

### Law of Natural Watercourses

Description--

Arkansas is a riparian theory state (1), and the Arkansas cases define a watercourse similarly to most other riparian jurisdictions. A watercourse is basically a stream of water flowing in a definite channel, having a bed, sides and banks, and discharging into another stream or body of water, although the flow need not always be constant (2).

Arkansas at one time followed the natural flow branch of riparian law (3). Although the early natural flow cases were never repudiated, the Arkansas Supreme Court in the 1930's began modifying this theory by noting that the right to a stream's natural flow was subject to reasonable use by upper proprietors (4). In the 1950's, the court then clarified the confusion that had resulted from the earlier inconsistent opinions. In *Harris v. Brooks* (5), the owners of riparian land adjoining a non-navigable lake sued to enjoin the lessees of another parcel of riparian land from pumping water from the lake, thereby making the lake less suitable for fishing, recreation, and other purposes. The plaintiffs rented cabins on the lake to vacationers and the defendants were pumping water to irrigate a rice crop. The court held for the plaintiffs, and while in the course of its opinion it did not specifically overrule prior natural flow opinions, it did say that whenever the two theories produced inconsistent results, the reasonable use theory should prevail where vested rights may not prevent such a result. The court also distinguished between "natural" uses--in particular, domestic consumption--as to which the natural flow theory still applied and which uses were, consequently, superior to all other uses of the water; and "artificial" uses, which included all other lawful uses of water, such as fishing, swimming, and irrigation. As to these uses, the reasonable use theory would apply--any of these uses would be inferior to an asserted "natural" use, but with this exception they would all stand on equal footing.

In the *Harris* case, all of the desired uses--both plaintiffs' and defendants'--were artificial. Therefore, to determine whether the defendants' artificial use was reasonable or not, the court said that it was necessary to consider all factors, including the purpose of the use, its extent, duration and necessity, the nature and size of the body of water, the other uses customarily made of the water, and the extent of the injury to one proprietor as compared to the benefit to the other. Weighing all of these factors, the court held that, although irrigation was generally a permissible use, in this case the pumping for irrigation purposes so depleted a small lake and harmed the other landowners as to be unreasonable and therefore enjoinable (6).

As a result of this and other decisions, Arkansas is basically a reasonable use riparian jurisdiction. In theory, an aggrieved riparian who asserted a loss of water for domestic purposes because of upstream diversion for irrigation could assert a "natural flow" cause of action and prevail under present Arkansas law, without regard to the reasonableness of defendant's conduct. However, what is typically being diverted from natural watercourses by an on-land application system is *effluent,* not water. Therefore, while a downstream industrial user might complain about the loss in flow if that user was not helped by the improved *quality* of the water, such a use is "artificial" and, under the Arkansas formulation, stands on only an equal footing with the upstream irrigation use. In such a case the reasonable nature of the irrigation use would be legally relevant and would most likely prevent injunctive relief. Only a domestic user would have a "natural" priority, but such a user would not be using the diverted wastes for domestic purposes in the first place, and consequently would not have damages sufficient to base a lawsuit.

Except for the above confusion between the natural flow and reasonable use theories of riparian law, Arkansas, on most other points of the law of natural watercourses in relation to on-land application systems, is a typical reasonable use jurisdiction. There is, however, a paucity of legal authority on a few important points, presumably due to the relative lack of industrialization in Arkansas.

There are cases indicating that there will be liability where a landowner can prove that he has been damaged by obstruction (7), diversion (8), or pollution (9) of a natural watercourse. In any such cases, injunctive relief or money damages are available remedies to the complaining party. There is some doubt whether, in a suit for injunctive relief, Arkansas will allow the "balancing of equities" defense. In *Meriwether Sand & Gravel Co. v. State* (4), where an injunction was granted to prevent what was characterized as "continuous and progressive" injury to a stream, the court rejected the defendant's defense that it was a lawful business operated in a usual and customary manner. The court, however, did not say that such a factor could never be considered in defense of a suit for injunctive relief, and in the later case of *Smith v. Magnet Cove Barium Corp.* (10), an injunction was denied where the corporation was polluting a creek with barium tailings. The grounds for denial were that the plaintiff landowners had an adequate remedy at law for money damages and their harm was measurable by the decline in market value of their land. Except for this slight doubt, since the question of whether to balance equities has never been squarely presented to the Arkansas Supreme Court, it seems that all traditional equitable defenses, such as the doctrine of "laches" (4), would be recognized in a suit for injunctive relief.

In a suit for money damages, Arkansas follows the usual rule that for permanent harm the proper measure of damages is the difference in the market value of the affected land (11); and in the case of temporary harm, damages will be measured by the loss in use or rental value to the owner, and not by the loss in salable value (12).

### Implications for Land Application Systems--

The Arkansas law of natural watercourses, like that of other riparian states, does not distinguish between the different types of land application systems, such as the several types of irrigation methods, the overland-flow method, or the rapid infiltration method. The law is concerned instead with the *effect* of any proposed use on the quality and quantity of the water flowing in a natural watercourse and on the uses that may be made of that water by other riparians. Also, since Arkansas has no administrative regulations pertaining directly to natural watercourses and the establishment of land application systems, the recommendations regarding establishment of such systems in Arkansas are the same as the general recommendations for natural watercourses in riparian states found in Volume I of this report.

With regard to the possibility of an application system interfering with the flow of a watercourse, the Arkansas law of natural watercourses has generally favorable implications. Any of the possible methods of application would be defined as "irrigation" within Arkansas law, and Arkansas has held that irrigation is a reasonable--and therefore permissible--use of the waters of a natural watercourse. Since Arkansas has reached that conclusion in situations where the irrigator is diverting the pure waters of a stream, the same conclusion is even more likely where the irrigator is diverting primarily wastes and, as a result, improving the stream's quality.

This general conclusion of reasonableness does not mean that every conceivable land application system would be shielded from legal consequences in every conceivable Arkansas forum. A particular project might divert a tremendous amount of wastes and, necessarily, some water along with the wastes. If this occurred on a stream where a downstream landowner could prove that he was harmed by the loss of wastes and water flow, that owner would have a claim against the operators of the system. To minimize the possibility of liability still further, there are several steps that can be taken in the institution and operation of land applications systems.

1. In establishing sites for land application systems, consideration should be given to the nature of the uses of the water occurring downstream from the point of diversion. The existence of a large water consumptive user whose use does not depend on the quality of the flow would be cause for concern. Although there is no precise boundary that can be stated, the further downstream the conflicting use is located, the less relevant it is, since it will be more and more difficult for that user to prove the land application system to have caused any harm to his operation.

2. In establishing sites for land application systems, consideration should be given to the volume of flow of the stream or river from

which diversion will be made. The same diversion may tremendously affect the quantity of flow on a small stream but have only a marginal impact on the quality of flow on a large stream.

3. If diversion of wastes will occur from a natural watercourse (as opposed to diversion before the wastes enter a natural watercourse), care should be taken to insure that as much of the water as possible is either left in the watercourse, or if removed, returned at or near the point of original diversion.

The law of natural watercourses also intersects with land application systems when, after application, trace contaminants remain on the land and are eventually washed into a natural watercourse. Such a result will not always occur. The nature and quality of trace contaminants remaining after application will be a function of the method of application used and the skill with which it is applied.

Operators of land application systems can be liable in Arkansas for pollution of the waters of a natural watercourse if, in a particular situation, some contaminants may drain into the watercourse. This can occur with a use that is reasonable; it being recognized that even reasonable uses may harm other interests and should compensate those harmed as part of the cost of operation. Although, in legal theory, money damages or an injunction are the relief an injured downstream landowner could receive, the likelihood, as in other riparian states, of either type being awarded is extremely remote.

There is no way operators of application systems can totally eliminate the possibility of liability for trace pollution of a natural watercourse. Even if all required operation permits are obtained, they do not shield the operators from possible liability. Several steps, such as the following, may be taken to further minimize the possibility of risk.

1. In establishing sites for land application systems, consideration should be given to whether the desired method of application and the soil characteristics will cause a greater residue of pollutants than would occur with a different method of application or on different soil.

2. In establishing sites for land application systems, consideration should also be given to whether there is a watercourse located close enough to the application site so that pollutants might frequently drain into the watercourse, such as during heavy rainfalls.

3. If there is a watercourse located close to the application site and likely to occasionally receive trace pollutants, then consideration should be given to the nature of the downstream uses and whether any of them are likely to be harmed by the types of pollutants that may be discharged and the quality and flow of the watercourse and the impact the pollutants will likely have upon that quality and flow.

Unlike some other riparian states, Arkansas does not have any administrative regulations requiring methods of control insuring that a high percentage of pollutants remain within the perimeter of the system instead of draining into the watercourse, limiting the volume of discharge during irrigation, and monitoring discharges to insure water quality. Prudence still requires that precautions be taken, because an important element in litigating to determine reasonableness in water use is proof of the care attendant on the institution of that use.

## Law of Surface Waters

### Description--

The Arkansas law of surface waters is in a state of some confusion. Although early Arkansas decisions stated and applied the so-called civil law rule, it is clear that the rule has been modified, if not supplanted in Arkansas. The pertinent questions not fully answered by the Arkansas court decisions are to what degree the civil law rule has been supplanted, and what theory has replaced it.

One of the earliest cases departing from a pure "civil law" viewpoint was *Baker v. Allen* (13), decided in 1899. An owner of low-lying rural lands built a levee to prevent his land from being flooded by surface water. The levee caused water to back up across the lands of the plaintiff, an upper proprietor, who sued to compel the levee's removal. The court stated that, under common law, each landowner had the right to protect his land against surface water, but that Arkansas had adopted the rule that the right to obstruct natural drainage was not absolute, and that a landowner would be liable if he unnecessarily injured the upper landowner by erecting a levee where, by reasonable care and expense, he might have avoided the injury. The court characterized surface water as a common enemy, but qualified this characterization by stating that one landowner cannot make his estate more valuable by an act which *unnecessarily* makes his neighbor's property less valuable. In this case, the levee was held to be necessary for the protection and development of the defendant's property and so the injunction was denied.

Although this would seem to establish some form of the common enemy rule in Arkansas, a distinction was made between rural and urban areas nine years later in *Levy v. Nash* (14). In this case, which occurred in what was characterized as an urban setting, Nash sued Levy because of improvements made by Levy to his property in Little Rock. Levy closed a culvert causing water to back up on Nash's sidewalk and backyard. The trial court required Levy to remove any obstruction to free passage of water through the culvert, but on appeal the Arkansas Supreme Court noted that Levy was forced to close the culvert in order to protect his own land against overflows by surface water caused by obstructions raised by owners below him. The court denied the requested relief, stating:

> The lot of the defendant is in the midst of a populous city. The rule which governs the right to dispose of surface water in agricultural districts does not apply to such property.

> It is set apart, held, and owned for building purposes. To make it useful for this purpose, the owner has the right to fill it up, elevate it, to ditch it, to construct buildings on it in such a manner as to protect it against the surface water of an adjoining lot. If in doing so he prevents the flow of surface water upon his lot, the owner of the higher lot has no cause of action against him. (15)

The *Levy* opinion clearly adopted a common enemy rule for urban areas, but in doing so it implied that the rule was different in rural areas. Indeed, an urban-rural distinction, with the common enemy theory applied in urban areas and the civil law rule applied in rural areas, is not unusual (16); what is unusual is that the Arkansas Supreme Court apparently applied such a distinction within ten years after it renounced the civil law rule without regard to the characterization of the area in question.

The only way to synthesize the various Arkansas decisions would be to say that, in a rural setting, a landowner can fend off surface waters as long as he does so without unduly damaging his neighbors (17), but in an urban setting he has an absolute right to prevent surface water from reaching his property without regard to the harm he may be causing his neighbors (18). This would establish a pure common enemy rule in urban areas and a modified common enemy rule in rural areas; the combination would be unusual in that it might tend to encourage urban landowners to act in bad faith, or without regard for the harm done to others. In *Timmons v. Clayton* (19), however, the Arkansas Supreme Court supported this unusual distinction. *Timmons* involved erecting a levy in an urban area, and the court restated the rules of all of the earlier cases without modifying their possible inconsistencies. It cited *Levy* (14) for the flat proposition that in an urban area the land owner may block surface water to improve his property; and cited *Baker v. Allen* (13), among other cases, for the rule that in areas outside urban centers the landowner can protect against surface water where the method he uses is the practical method for protecting the land and where he acts in good faith and is free from negligence.

The implication is clear that in urban areas the landowner may not only prevent the "common enemy" from reaching his property, but may do so even in bad faith or negligently. It may be that, squarely faced with the issue, the court would retreat from this extreme application of the common enemy doctrine. In particular, since Arkansas has applied the reasonable use rule to both natural watercourses and percolating waters, it is possible that, were the issue presented anew, Arkansas might adopt a reasonable use analysis in regard to surface water as well. At the very least it is clear that the civil law view, involving minimum disturbance of the natural order of things, would not be applied in Arkansas today. This view would be the most restrictive of on-land application systems that might change traditional surface water patterns, and its demise is a favorable sign, no matter what rule Arkansas eventually settles upon as its replacement.

It must also be noted, in attempting to define the Arkansas law of surface waters, that virtually all of the Arkansas case law involved diversion or obstruction by a landowner of surface water coming to his land from another's land. There are no Arkansas cases involving the right of a landowner to either use surface water reaching his property or discharge, either intentionally or unintentionally, trace pollutants into surface waters which then flow across the land of another. The first proposition has never been questioned in Arkansas, and it must be seriously doubted whether lower landowners would have any right to prevent the upper landowner from making whatever use he pleased of the surface water. Riparian rights do not attach to surface water until it reaches a natural watercourse, and in riparian theory states, including Arkansas, there is no other cognizable concept of "right" in water which would restrict consumption of surface water on the land where it is found.

The second proposition, pollution of surface waters, cannot readily be handled under either the civil law or common enemy rules or any of their variations. In view of Arkansas' movement toward the reasonable use theory in other areas of water law, it is highly likely that any such case arising in the future would be resolved under the standard of reasonableness.

### Implications for Land Application Systems--

The Arkansas law of surface waters makes no distinction between the several different types of land application systems. The case and statutory law in this area is sparse, and is primarily concerned with the right of one landowner to discharge surface waters across the land of another. As is true of most riparian states, Arkansas law has extremely favorable implications for land application systems in situations where both pollutants and diffused surface waters are retained at the application site. It has only slightly less favorable implications when both substances are dispersed to adjoining lands.

In the case of trace pollution of surface waters crossing the lands of another person, Arkansas simply has no law directly on point. The Arkansas surface water cases are almost exclusively concerned with the issue of an upper landowner creating a discharge that did not previously exist, usually by building on or paving his property, and not with the issue of adding pollutants to an already existing surface water flow. Probably, given its recent trend in that direction in other areas, Arkansas would apply a rule of reasonable use to such pollution. Since, as we have established with regard to natural watercourses, land application systems are reasonable uses under the Arkansas case law, this would mean that it is very unlikely that a land application system in Arkansas would be prevented from operating because of trace pollution of surface waters. The operators of land application systems might have to pay for damages caused to adjoining landowners, but the possibility of such liability is even less likely in the surface water category than it is in the natural watercourse category.

On the other hand, if the system collects both surface waters and trace pollutants on its property, there is not even a possibility of liability for interference with the flow of surface waters. It is clear that because the lower landowner has no "property" right to the surface waters, he cannot insist on their continued flow. The upper landowner--in this case the land application system--can with impunity collect all surface water on its property.

In creating land application systems, consideration should be given to prevailing surface water patterns, including topographical studies, precise locations where surface waters are likely to flow, locations of springs, water supply wells and buildings on adjoining lands and specifications of any adjoining land uses that might be harmed by either the interruption of surface water flow or the addition of trace pollutants.

## Law of Groundwater

Description--

Arkansas has adopted the reasonable use rule to resolve issues concerning subterranean percolating waters, which includes all groundwaters except those flowing underground in natural watercourses. In *Jones v. Oz-Ark-Val Poultry Co.* (20), the defendant company was using the water from seven wells on its property to process 12,000 chickens daily. Jones sued for injunctive relief, asserting that the operation of the chicken processing business caused their artesian wells to go dry. After briefly discussing the rule of capture, which the defendant company asserted justified its conduct, the court noted that Arkansas had adopted the reasonable use rule to govern the water rights of riparian owners of land adjoining natural watercourses, and said: "We see no good reason why the same rule should not apply to a true subterranean stream or to subterranean percolating waters" (21). The majority of the court then concluded that it was unreasonable to permit the company to use thousands of gallons of water each day to process chickens when that use did not leave enough water to satisfy the domestic needs of the neighbors.

Since Arkansas follows the reasonable use rule with regard to percolating waters, questions of possible liability for interference with such waters will be resolved in accordance with reasonable use analysis as developed with regard to natural watercourses. One further question, however, is whether liability for *pollution* of percolating waters would be governed by the same reasonable use standard as is liability for *excessive use* of percolating waters. This question is not clearly answered by Arkansas case law.

Theoretically, there can be damages for pollution of percolating waters in Arkansas; in practice, however, liability has been denied in each of the reported cases. In addition, the basis for possible liability has not been clearly stated in any case. In *Magnolia Petroleum Co. v. Smith* (22), the plaintiff, Smith, sued for permanent damages for the destruction of his well caused by an overflow of gasoline from the defendant's property. The plaintiff's lawsuit was based on the negligence theory, but the supreme court did not consider whether it was necessary to prove negligence in order to recover for pollution of a well. Instead, it held that since the overflow had occurred only twice in two years, the trial court erred in allowing damages on a theory of permanent rather than temporary harm. The whole opinion is couched in terms of negligence, which is consistent with a reasonable use standard governing questions of pollution, but since the plaintiff did not attempt to assert any theory of strict liability, the case cannot be read as definitely rejecting such a theory.

In *Faires v. Dupree* (23), the plaintiff sued for money damages for the loss of a spring due to seepage of garbage from the defendant's hog farm. Although the court's opinion is not clear, it appears that the plaintiff sued on a theory of nuisance. Such a theory could imply liability in the absence of negligence, but would not necessarily exclude considerations of reasonable use by the defendant, however, the court again did not reach the theory of liability issue, holding instead that the plaintiff failed to show an ascertainable monetary loss sufficient to sustain an award of damages.

### Implications for Land Application Systems--

The Arkansas law of groundwater does not distinguish between the different types of land application systems. Instead, the law is primarily concerned with landowners' competing rights to use such water, and secondarily with the consequences of groundwater pollution or corruption.

With regard to the possibility of trace contaminants reaching groundwater supplies, Arkansas law has favorable implications for establishment of land application systems. Since Arkansas has taken the reasonable use analysis from the natural watercourse area and applied it to groundwater, the basic analysis of land application systems and their relation to groundwater law is the same as has already been discussed under natural watercourses. There are, however, a few differences in analysis which should be set forth.

First, the collection of wastes to be used after treatment will not interfere with dispersal of groundwater, whereas, as we have noted, that collection could occasionally involve the collection of water from a natural watercourse. Therefore, any problems involving land application systems and their possible impact on groundwater will occur at the *end*, and not the *beginning*, of the application process, that is, what happens after application.

Second, almost the entire law of groundwater in Arkansas, as in several other riparian states, deals with the *use* of groundwater by competing owners of land above the groundwater supply. There is very little law considering the issues of groundwater pollution or discharges that interfere with the pre-existing water cycle.

From the point of view of the operators of land application systems, if liability were asserted because of pollution of a groundwater supply, the worst that could happen would be a similar analysis as would happen in a case involving pollution of a natural watercourse. Only affected landowners could sue, not the general public. Those landowners would have to show that the system polluted a groundwater supply, that they were drawing from the same groundwater supply, that the polluted waters they drew harmed their land, and the specific decline in market value of the land. Although the same remedies are available as in the natural watercourse area, again an injunction is unlikely to be granted against a reasonable use, and money damages will be difficult to prove and will, in any event, be limited to a decline in market value. Arkansas is not one of the states that applies a stricter standard to groundwater than to natural watercourses and holds a polluter "strictly" liable, that is, liable without proof of negligence. All the reported Arkansas decisions, in cases where the basic use of the overlying land was said to be reasonable, have been in favor of the defendant.

Where an adjoining landowner complains because, in the absence of pollution, groundwater recharge from an application site raises the water level of the groundwater, he will have an even more difficult time in attempting to sue the system's operators. There are no cases in Arkansas allowing recovery by a landowner in the absence of provable negligence in the operation of the system and intentional harm being done.

Thus, in theory the system operators could be found liable if the application system caused pollution of groundwaters, and probably could not be found liable for mere raising of the water level in the absence of pollution. There are some precautionary steps that can be taken to minimize the possibility of liability. Some of these include limiting irrigation fields to sites with a specified maximum elevation of groundwater; controlling specific aspects of operation such as rate of application, grade or slope of spray fields, and alternate distribution of effluent; and requiring groundwater monitoring in the area of the system. Unlike some riparian states, however, Arkansas has no administrative regulations requiring any of these steps be taken.

## Summary

Despite the fact that the basic water law of Arkansas--in all categories--is favorable, the state has some administrative regulations and informal guidelines, even though not directly related to water rights, that are among the least favorable to the possibilities for establishing land application systems. This posture appears to result from the view held by the relevant administrative agencies that on-land application is undesirable.

The Arkansas Department of Pollution Control and Ecology (24) has broad rule-making powers in the general area of water pollution under the Arkansas Water and Air Pollution Control Act (25) that deal generally with sewage disposal (26). However, the department's interpretation of its powers under the Act assumes that, after treatment, all wastes will be either discharged into the waters of the state or dumped into on-land holding basins, but will not be put to an "affirmative" use such as irrigation (27).

None of the regulations promulgated by the Department of Pollution Control and Ecology specifically cover on-land application systems. Such systems, however, could be indirectly affected by the department's Water Quality Standards, Regulation No. 2 (28), if runoff, after application, into the waters of the state occurred (29). That regulation, which sets forth water quality criteria for waters of the state, requires secondary treatment of wastes before discharge into waters of the state and establishes various "use classifications" for those waters. It does not, however, establish any specific procedures for sample collection, measurements, or analysis or consider the technology of land treatment of effluent.

By way of contrast to the Department of Pollution Control and Ecology, the Division of Engineering within the Arkansas Department of Health (30) has informal guidelines directly governing irrigation with wastewaters. These guidelines and the division's policy are restrictive on land application systems. The division reviews each application for a land treatment system on an individual basis and requires an engineering design. Division approval must be obtained before effluent or sludge from any type of sewage treatment plant can be used for irrigation, fertilization, or soil conditioning. While the guidelines allow the use of both treated domestic effluent and industrial sludges, whereas some other states with similar regulations or guidelines allow only treated domestic effluent, the only crops approved for growing on wastewater irrigated lands in Arkansas are forage crops. This is the most stringent category to be found in any state's regulations or guidelines. In addition, the quality of the effluent to be applied is specifically stated--chlorinated secondary treatment (31).

In general, the strict Arkansas regulations and guidelines have no compelling basis under either the Arkansas statutes or the Arkansas law of water rights. Despite the adverse regulatory posture, the basic water law of Arkansas is favorable to land application systems. Arkansas statutes, in authorizing rule-making authority to the Department of Pollution Control and Ecology and the Department of Health, grants them broad powers to either encourage or discourage land application systems. While liability from operating land application systems could ensue, in theory, under the water rights law of any riparian jurisdiction, Arkansas' law is more favorable than unfavorable. The use of the reasonable use rule in two of the three major categories of water, the absence of any theory of strict liability, and the supreme court's requirement of demonstrative proof of monetary harm before relief will ensue, all serve to create a favorable legal climate for a well operated land application system.

## FLORIDA

### Law of Natural Watercourses

Description--

Florida is a riparian theory state and the Florida cases define a watercourse similarly to other riparian jurisdictions. A watercourse has been defined by the Florida courts as basically a stream of water flowing in a definite channel, having a bed, sides and banks, and discharging into another stream or body of water, although the flow need not always be constant (32). It is also clear that an artificial drain, ditch, or canal can, with passage of time, be treated as a natural watercourse (33).

The reasonable use version of riparian rights was adopted in Florida before the turn of the century in *Tampa Waterworks Co. v. Cline* (34). That case involved an underground stream, but the same rules are applied to a watercourse whether it flows on the surface or underground. Thus, it appears that one's use of water in a natural watercourse may be reasonable or unreasonable depending upon the right of other riparians to use the same water. Although the Florida cases have not addressed the question of whether an artificial use, such as water used in manufacturing, would call for the application of a different rule, the type of use would almost certainly be a factor in determining reasonableness.

The Florida position in regard to diversion of a watercourse was established in *Labruzzo v. Atlantic Dredging & Construction Co.* (35), which also involved an underground stream. The court in this case distinguished intentional invasions of water rights from unintentional invasions. Thus, if the diversion of a watercourse is unintentional, the diversion is actionable if the conduct causing the diversion is negligent, reckless, or ultrahazardous. By contrast, if the diversion is intentional, the diversion will be actionable if the conduct is unreasonable under all the circumstances of the case.

As far as pollution of a natural watercourse is concerned, the application of the reasonable use rule allows some pollution if the pollution is reasonable under all the facts of the case. This broad application of the reasonable use rule may allow a watercourse to become polluted, but it has been justified as a desirable rule for a jurisdiction such as Florida which has wanted to attract industry to the area. An example of the doctrine's operation is the leading case of *Taylor v. Tampa Coal Co.* (36). In that case, the riparian landowners on a lake sought injunctive relief against the defendant citrus grower (Taylor), who had been withdrawing large quantities of lake water to irrigate his citrus groves. In enjoining the defendant from diverting the lake water during any dry season, the court invoked the reasonable use rule. Stating that riparian rights to the use of waters are equal, the Florida Supreme Court said: "Except as to the supplying of natural wants, ...such as drinking, washing, cooking, or for stock of the proprietor, each riparian owner has the right to use the water in the lake for all lawful purposes, so long as his use of the water is not detrimental to the rights of other riparian owners" (37). Applying this reasoning, the court determined that "...the lake is too small in area and content to allow water to be pumped therefrom for irrigating purposes without consequent damage to other riparian owners" (37).

The possibility of liability for pollution of a watercourse is further restricted by the requirement that a plaintiff either establish concert of action when more than one defendant contributes to the pollution, or establish the extent of damage caused by each polluter. Thus, in *Standard Phosphate Co. v. Lunn* (38), the plaintiff (Lunn) was unable to get redress for pollution of a stream caused by the dumping of waste into the stream because there was no concert of action between the two defendants. Since there is normally no concert of action by different polluters of a stream, the plaintiff will be faced with the almost impossible task of showing the damage caused by each polluter's conduct.

In addition to this rather stringent requirement of proof of harm, Florida also recognizes all traditional equitable defenses in a suit for injunctive relief, including "balancing of the equities," which is called the "balance of convenience" doctrine in Florida.

Implications for Land Application Systems--

Florida law of natural watercourses has generally favorable implications for land application systems, whether one is referring to either possible interference with water flow or possible discharge of trace pollutants. Since Florida follows the reasonable use rule of riparian rights, the repercussions caused by the possible drainage of contaminants into a watercourse would seem to depend upon which watercourse is affected. Should contaminants drain into the watercourse which had previously been used for disposal of the waste, no problem will be presented. Since at least some of the polluting qualities of the waste will have been removed during treatment and application, it would certainly be reasonable for smaller quantities of waste to enter the watercourse than the large quantity of pollutants previously dumped directly into the water. The only possible problem will occur if a discharge finds its way into a different watercourse. Should this situation arise, the amount of contaminant which drains into the watercourse and the quality of the watercourse will have to be considered in determining whether the drainage violates the reasonable use rule. Although the requirement of establishing concert of action or the damage caused by each polluter would make liability unlikely under the reasonable use rule, it is obvious that steps should still be taken to apply the wastewater to lands which drain into the original watercourse when feasible in order to avoid as many problems as possible.

To minimize the possibility of liability caused by interference with the flow of watercourses and with trace pollutants still further, the recommendations set forth in Volume I of this report for natural watercourses in riparian states and for Arkansas in Volume II should be followed without modification.

## Law of Surface Waters

Description--

The problems involved with surface waters are usually presented in the context of an upper landowner attempting to impose the entire burden of disposal upon the lower owner. As is true in other states, the majority of Florida cases address the question of the extent to which a landowner can affect the natural drainage of surface water. Since surface water is usually an undesirable form of water which each landowner regards unfavorably, the rules concerning retention and use of surface waters and the pollution of surface waters are seldom discussed.

The most significant aspect of the problems involved in the use of surface waters is the absence of Florida cases dealing with the question.

The rule which emerges from other jurisdictions that have considered the question seems to be a rule of absolute ownership (39). Language in several Florida decisions indicates that Florida would also allow the landowner to gather and use all surface waters reaching his land.

The decisions by Florida courts involving *disposal* of surface waters represent an adoption of the civil law rule of natural flow, but with many modifications. The civil law rule has not been expressly accepted, but the actual outcome of the cases and the language used in the opinions lead to the conclusions that a modified civil law rule is applied.

The first case to deal with the problem was *Callan v. G. M. Cypher Co.* (40), wherein the plaintiff sought to enjoin the defendant from constructing a ditch to be used to drain surface water into a natural watercourse. Although the supreme court discussed both the rule against diversion of the natural flow of surface waters and the rule against taxing a watercourse beyond its capacity by drainage of surface waters, the court did not adopt either rule since the facts did not show that the defendant had violated either rule.

Three years later, the Florida Supreme Court was again faced with a surface water diversion problem in *Brumley v. Dorner* (41). In that case, the county had constructed a road near the plaintiff's property and the plaintiff alleged this obstructed the natural flow of surface water drainage to the north, and also that the ditch along the road cast water from his neighbor's land onto his land which otherwise would have drained to the north. In affirming the overruling of the defendant's demurrer, the Florida Supreme Court discussed the civil law rule and the common enemy rule and the modifications of each. Then, the court declared the universal rule to be that "...no person has the right to gather surface waters that would naturally flow in one direction by drainage, ditches, dams, or otherwise and divert them from their natural course and cast them upon the lands of the lower owner to his injury" (42).

The application of the *Brumley* rule may not always allow the plaintiff to prevail even if surface water is drained into a natural watercourse and flooding damages the plaintiff's land. The plaintiff may lose if his conduct has contributed to his injury. Thus, in *Stoer v. Ocala Manufacturing, Ice & Packing Co.* (43), the plaintiff's claim was rejected because of the finding that the plaintiff's negligence in failing to keep the natural watercourse open caused the flooding and not the drainage of surface water into the natural watercourse. Similarly, in *Bray v. City of Winter Garden* (44), the plaintiff failed to get an injunction and an award of damages because of a finding that the overflow was the result of the plaintiff neglecting his duty to keep the watercourse open.

The reasoning of the *Bray* decision was recently applied in *Hodge v. Justus* (45), where the District Court of Appeals affirmed the trial court in setting aside a jury verdict for the plaintiff and entering judgment for the defendant since the plaintiff failed to establish a causal connection between the damage done to the plaintiff's land and the land clearing and construction activities carried on by the defendant. But the court in the

*Hodge* case expressly rejected the contention that an upper owner could collect and dispose of surface waters in any manner, even though the quantity discharged upon adjacent land is substantially increased. An analysis of the decision illustrates the divergence between the modified civil law rule expressed in the Florida cases and the actual results of those cases.

In rejecting the contention that an upper owner could dispose of surface waters in any manner he chooses, the court in the *Hodge* case relied upon the recent decisions in *Gwinn v. Andrews* (46) and *New Homes of Pensacola, Inc. v. Mayne* (47). Both cases used the traditional civil law rule language of "natural flow" and "servitude upon the lower owner" in expressing the Florida rule. In *Gwinn* the defendant constructed a concrete patio which blocked the natural drainage of surface water from the plaintiff's land and was required to pay damages and restore the natural drainage. In the *New Homes* case, the defendant used a drainage ditch to dispose of surface water runoff from a subdivision. The ditch was negligently maintained and the flow of surface water runoff caused the plaintiffs' land to erode. In affirming the grant of a mandatory injunction against the defendant, the appellate court stated that the servitude imposed upon the lower owner "...ordinarily extends only to surface water arising from natural causes and cannot be increased or made more burdensome by the acts or industry of man" (48). Thus, the court reasoned that the developer was under a continuing obligation to provide and maintain an adequate drainage system.

Therefore, it seems that the rule governing surface water disposal allows an increased amount of surface water to be drained from an owner's land as long as he exercises due care in disposing of the runoff. Furthermore, the use of land which caused increased runoff is further limited by the rule against changing the natural direction of the drainage. This rule was applied in *Lawrence v. Eastern Air Lines* (49), where land was filled in and paved for the construction of an airport project. The dismissal of the complaint was reversed since the plaintiff had alleged the natural flow of surface waters had been altered.

In the absence of a change in the direction of natural drainage, the Florida rule as to drainage of surface waters is applied in such a manner as to allow development of land, but the development or use of the land must be done in a reasonable manner. Thus, in *Hodge* (45) a finding of no causal connection allowed the development of land without liability for the effects on surface water runoff. In contrast, the development of the land in *Koger Properties, Inc. v. Allen* (50) was carried out in such an unreasonable manner that the defendant was held liable for compensatory and punitive damages. In *Koger Properties*, the increased runoff caused by the construction of an office building and the paving of a parking lot was collected in a drain system which discharged the water into a ditch directly across from the plaintiff's property. The defendant knew the ditch would be overburdened and asked the city to improve the ditch. But, before the city improved the ditch, the defendant went ahead with his plans and the plaintiff's house was flooded by the runoff. The court explained that a developer of such concrete and asphalt complexes should use reasonable care to guard against injuring a neighboring landowner and held that on the facts of the case, the developer was grossly negligent.

Florida has no water law rules addressing the problem of pollution of surface waters. This is not unusual, since the use of surface waters has not been widespread and, thus, the pollution of surface waters had not been a topic of great concern. It is arguable that the rule providing the servitude imposed upon the lower owner cannot be increased or made more burdensome by the acts of industry of man, which, if applied to drainage cases, could be applicable to situations involving pollution. But, in light of the increasing awareness of the hydrological cycle and the adoption by the Florida courts of a rule of reasonableness applicable to other water rights problems, it would seem that a rule of reasonable use would be applied to pollution of surface waters should the question be presented to the Florida courts today.

Implications for Land Application Systems--

Florida law of surface waters has generally favorable implications for land application systems. Although there are no Florida cases directly in point on questions of trace pollution of surface waters, it is most likely that Florida will apply the rule of reasonable use which it applies to questions of pollution of natural watercourses. Since Florida's application of the reasonable use rule is one of the most favorable from the viewpoint of a potential defendant, liability for trace pollution of surface waters appears to be a remote possibility.

On the other hand, if a land application system collects both surface waters and trace pollutants on its property, rather than discharge both across adjoining lands, it is equally unlikely that there would be liability. Although Florida again has no cases directly in point, the universal riparian rule is that the lower landowner has no "property" right to surface waters, and cannot insist on their continued flow. The upper landowner--in this case the land application system--can with impunity collect all surface water on its property.

In addition to the general considerations previously mentioned for Arkansas and those set forth in Volume I of this report under the law of surface waters for riparian states to be taken into account when creating a land application system, Florida has pertinent guidelines relating to land application of domestic wastewaters (51). The Department of Environmental Regulations expects that these guidelines will be adopted in their present form as official regulations by the spring of 1978 (52). Under these guidelines various buffer zones are required around application sites (53), including that the boundary be between 200 and 500 feet from a private drinking water source depending upon the design capacity of the application system (54). The distances to public roadways, residences, or residentially zoned areas are dependent upon the extent of treatment and disinfection, method of irrigation application, prevailing wind direction, and the presence of shrubs or trees around the site (55). The guidelines specifically provide that the system must be designed to prevent runoff from entering or leaving the project site. Storm runoff, on the other hand, may be retained within the project area and released to surface waters, if applicable surface discharge standards are met (56).

## Law of Groundwater

### Description--

The problems associated with the use of groundwater were presented to the Florida Supreme Court in the early case of *Tampa Waterworks Co. v. Cline* (34). The plaintiff in this case alleged that the defendant company's excavations would divert and pollute an underground stream which supplied the plaintiff's spring. In affirming the trial court's denial of the requested injunction against the defendant's continued excavations, the supreme court distinguished percolating groundwater from underground streams and held that the same rules that apply to surface watercourses also apply to underground streams. Thus, the defendant could not divert or pollute the stream, but he could open a water supply and make a reasonable use of the water.

The *Tampa Waterworks* decision established that the reasonable use rule would be applied to the use of waters in a surface or subsurface stream, but it also created some uncertainty with its *dictum* concerning percolating groundwater. The court indicated that the landowner could appropriate the entire supply of this type of water to his own use. But, this apparent adoption of the English rule regarding use of percolating groundwater was soon questioned and rejected. In *Cason v. Florida Power Co.* (57), the defendant's dam on a river caused the groundwater not to drain from the plaintiff's land, thereby raising the level of the groundwater and damaging the plaintiff's land. In reversing the trial court's direction of a verdict for the defendant, the supreme court stated that the rights relative to the passage of percolating water were correlative and that there was a jury question presented as to whether the defendant's actions were reasonable with reference to the rights of adjoining landowners. The use of percolating groundwater was finally squarely presented to the Florida Supreme Court in *Koch v. Wick* (58). In that case, the Pinellas County Board of Commissioners had leased a strip of land next to the plaintiff's land and were drawing the water supply for the public from their wells. The court rejected the English rule and applied the reasonable use rule. Thus, there was a jury question as to whether the extraction of so much water was reasonable and the court reversed the trial court and reinstated the complaint.

The reasonable use rules regarding diversion (as opposed to pollution) of percolating groundwater were discussed and given some further refinement in a more recent case. The plaintiff in *Labruzzo v. Atlantic Dredging & Construction Co.* (35) alleged that his neighbor's dredging on the St. Johns River caused his spring to run dry. The defendant contended the dredging was a reasonable use of his property and the plaintiff therefore had no cause of action. In reversing the judgment of the trial court, which had sustained the defendant's demurrer, the supreme court distinguished the rules regarding use of water and those regarding the use of land. The court noted that the problem was not a conflict over the use of water, but a problem of the defendant's use of his land, which interfered with the plaintiff's use of the water. Thus, the court stated that the reasonable use rule in regard to the use of water was not applicable.

In addressing the problem of the defendant's use of his land and its effect upon the plaintiff's use of the underground water, the court in *Labruzzo* distinguished intentional invasions of water rights from unintentional invasions. As to unintentional invasions, the plaintiff had a cause of action only if the defendant's conduct was negligent, reckless, or ultrahazardous. For intentional invasions, the plaintiff need only show the defendant's conduct was unreasonable. In applying the rule to the facts alleged, the court found that the first count of the complaint did not state a cause of action since there was no surface indication that the defendant's excavation would interfere with the plaintiff's spring. Thus, the court reasoned, any invasion was unintentional and since the plaintiff did not allege negligence, no cause of action was established.

As to the second count, the court found that a cause of action was established for an intentional invasion. The court reasoned that once the underground watercourse was discovered by the defendant, the question of whether obstruction of the underground watercourse could have been prevented by the exercise of reasonable care while excavating was for the jury.

The Florida rule in regard to pollution of groundwater is less well developed and appears more stringent than the rule regarding use or diversion of groundwater. In the early *Tampa Waterworks* case (34), the Florida Supreme Court dealt with the question of pollution of an underground stream. Although the court affirmed the judgment of the trial court dismissing the complaint, since the plaintiff had failed to make a sufficient showing of pollution or diversion, the court explained that the excavations made by the defendant could continue so long as this conduct did not pollute or divert the underground stream. Furthermore, the court stated that the defendant had a duty to prevent impurities in the surface water from draining into the excavation and polluting the underground stream.

The Florida position regarding pollution of groundwater had been stated even more strongly seven years earlier in *Pensacola Gas Co. v. Pebley* (59). The defendant in that case discharged polluted wastewater from its manufacturing operations upon the ground. As a result, the plaintiff's well on nearby land was polluted. Since there was no evidence that the well was supplied by an underground watercourse, the presumption of percolating underground water applied under Florida law meant that the court was faced with the question of pollution of percolating groundwater. Again, the court spoke of a duty imposed on the defendant to confine the wastewater to prevent injury to neighboring landowners. The origin of this duty is less than clear, since the court at various stages of the opinion, explained that the defendant's acts were "done at their peril," that the escape of the wastewater was "evidence of negligence," and that the defendants "continued the nuisance." Thus, whether the theory of liability was strict liability, negligence, or nuisance is uncertain. The impact of the decision is also uncertain, since the wastewater escaped from the defendant's land before seeping into the groundwater supply. The liability of the defendant for pollution caused by discharge of wastewater and seepage of pollution into the groundwater occurring on the defendant's own land is not directly addressed by the decision.

Although these two decisions seemingly apply stringent rules regarding pollution of groundwater in Florida, both cases were decided before the turn of the century and do not properly reflect the Florida attitude today. The present more liberal attitude is more clearly reflected in the 1951 *Labruzzo* decision (35). As previously discussed, the facts in that case presented a problem of diversion of underground water. But the rationale of the decision is equally applicable to pollution of underground water, since the court spoke in terms of use of land affecting use of water by invasions upon the right to use water. Certainly the use of land in such a way as to cause pollution of groundwater can be classified as an "invasion" of the right to use water. The applicability of the rules expressed in *Labruzzo* to either diversion or pollution situations is indicated by the court's reliance upon both diversion and pollution cases in reaching its decision.

Thus, it would appear that if one's use of his land causes an unintentional invasion of his neighbor's use of groundwater by pollution of the groundwater, liability will only attach if the conduct causing the pollution was negligent, reckless, or ultrahazardous. But once the fact that one's conduct is causing an invasion in the form of pollution of groundwater is made known to the landowner, liability for pollutuion will attach if the conduct causing the pollution is unreasonable under the circumstances.

Implications for Land Application Systems--

Possible pollution of groundwater supplies appears to be one of the major problems faced by a landowner who is considering the application of wastewater to his land in Florida. Since a major portion of Florida's water supply is derived from groundwater, one would expect the rules governing pollution of groundwater to be more restrictive than other water law rules. The early Florida cases seemed to impose a strict rule when dealing with pollution, but the present attitude seems to allow some pollution if the activity is reasonable under all the circumstances.

The problem of pollution will, of course, be lessened by proper treatment of wastewater before application to the land and by proper control of the amount of wastewater applied to the land. Florida's administrative guidelines establish extensive groundwater quality controls (60) and provide that a subsurface drainage system may be required by the Department of Environmental Regulation in order to prevent the groundwater table from rising into the plant root zone (61).

The problem of increasing the level of groundwater has been addressed in Florida and a reasonable use rule was applied to resolve the problem. Thus, even if the water table was raised by the application of wastewater to the land, the effects on surface drainage would result in liability only if the application of wastewater was unreasonable under all the circumstances. Under the Florida guidelines, application of wastewater can be coordinated with the seasonable rainfall, plant utilization of nutrients, infiltration capacity of the soil, and use of existing groundwater for irrigation in order to minimize the effects on the water table, and an underground drainage system could also be utilized in areas where the adverse effects on drainage would place an unreasonable burden on neighboring landowners (62).

In addition to the general precautionary steps set forth in Volume I of this report under the law of groundwater in riparian states and for Arkansas, the following requirements are specified in Florida's administrative guidelines:

1. Subsurface drainage systems, where required, must be designed so that the water table is drawn down to provide for a minimum of 36 inches of unsaturated soil thickness during the time when irrigation is not practiced (61);
2. An application rate in compliance with "conservative" hydraulic application rates, which will typically be up to an average of 2 inches per week (63);
3. Multiple ponds must be maintained to allow for alternate loading and resting (64); and
4. Groundwater monitoring is required in the area of the system, with a minimum of one groundwater well established in each expected direction of groundwater movement away from the land application site (65).

## Summary

Florida law is very favorable to land application of wastewater. In addition to possessing a basic water law that is favorable to innovative uses of water and a willingness to allow instances of trace pollutants to occur in connection with a reasonable use, Florida's administrative guidelines concerning land application are clear, concise, and not overly restrictive.

The Florida Department of Environmental Regulation's guidelines provide that: "It is the policy of the Department neither to endorse nor reject any means of wastewater treatment and disposal, but to encourage that all applicable alternative techniques be studied and evaluated prior to the selection of a cost-effective and environmentally acceptable treatment and disposal process for any specific site" (66). Land application, as regulated, includes "...any and all practices which result in the discharge of domestic wastewater effluents on, above, or under the surface of the ground except direct injection, ... [into] confined aquifers..." (67). Specifically, land application "...will include ... land irrigation methods such as spraying, spreading, furrowing, ditching, drainfields, and soakage pits..." (67).

After establishing criteria for the groundwater resulting from land application of wastewater, the guidelines then set forth minimum treatment requirements for various forms of land application. If fodder crops are being irrigated, basically secondary treatment and disinfection is required (68). If golf courses, cemeteries, public parks, or lawns are irrigated, then secondary treatment, chlorination, and a minimum of 7 days storage are required (69). The requirements for pasture land irrigation are the same as for fodder crops, with the additional provision that pastures irrigated with effluent shall not be grazed by dairy cattle within 15 days after irrigation (70). It is also expressly provided in the guidelines that irrigation with effluent is not permitted on crops intended for human consumption, with or without cooking (71).

The Florida guidelines also have extensive criteria pertaining to the design of land application systems. In addition to the requirements previously noted for buffer zones, prohibition of runoff, subsurface drainage, any hydraulic application rates, the guidelines control the location of sprinkler systems (72) and the design and location of holding basins (73), recharge ponds and wells (74), and percolation ponds (75).

## GEORGIA

### Law of Natural Watercourses

Description--

Georgia is a riparian theory state and has followed the reasonable use branch of the riparian doctrine since at least the middle of the nineteenth century. In Georgia's first case of record involving water rights, *Hendrick v. Cook* (76), the plaintiff sued to recover money damages on account of the defendants' construction of a mill dam that raised the water level 10 inches on the banks at the site of the plaintiff's mill shoals. The plaintiff sought to introduce evidence of diminution in value of his property because of the loss of the potential usefulness of the shoals, but the trial court disallowed the evidence, holding that there was no right of recovery unless the defendants had caused the water to leave its natural channel. On appeal to the Georgia Supreme Court, the defendants argued that they had a right by prior appropriation to throw water upon the plaintiff's shoals, but the court rejected this doctrine in favor of the riparian doctrine (77). The court held that the defendants, as riparian owners, had an interest in the flow of water in the stream, but that they did not have the right to use that water to the prejudice of other riparian owners. The court emphasized that riparian owners had equal rights to the waters of the stream.

The *Hendrick* case established a framework for the Georgia law of natural watercourses that exists to this day. In 1860 Georgia codified its riparian law; the codifiers treated *Hendrick* as establishing a strict reasonable use version of the riparian doctrine (78). Thus, Georgia became somewhat unusual among riparian states, in that its riparian law stems to a great degree from legislation rather than common law. In addition, unlike the relatively limited holding in *Hendrick*, the statutes enacted in 1860 were broad enough to prohibit *all* unreasonable interference with riparian rights. These enactments, although modified over the years, continue in force as part of titles 85 and 105 of the Georgia Code. The basic statutes are as follows:

> Sec. 85-1301 -- Running water, while on land, belongs to the owner of the land, but he has no right to divert it from the usual channel, nor may he so use or adulterate it as to interfere with the enjoyment of it by the next owner. (79)
>
> Sec. 85-1302 -- The beds of streams not navigable belong to the owner of the adjacent land; if the stream of water is the dividing line, each owner is entitled to the thread or center of the main current.... (80)
>
> Sec. 105-1407 -- The owner of land through which nonnavigable watercourses may flow is entitled to have the water in such streams come to his land in its natural and usual flow, subject only to such detention or diminution as may be caused by a reasonable use of it by other riparian proprietors; and the diverting of the stream, wholly or in part, from the same, or the obstructing thereof so as to impede its course or cause it to overflow or injure his land, or any right appurtenant thereto, or the pollution thereof so as to lessen its value to him, shall be a trespass upon his property. (81)

Section 85-1301 of the Georgia Code establishes a riparian owner's property right in the flow of water in the stream and section 85-1302, in turn, bases riparian rights upon ownership of part or all of the bed across which water flows. Sections 105-1407 and 85-1301 appear to overlap, at least in part; however, section 105-1407 proscribes many of the activities excluded from the riparian right by the former section 85-1301 (82). Riparian owners have a right to the stream's natural flow under section 105-1407, subject to reasonable diminution or detention by other riparians, while in contrast, section 85-1301 flatly prohibits diverting of the stream's waters. If the sections are read literally, what a riparian plaintiff must prove will vary with the label placed on the conduct of the defendant riparian. If defendant has engaged in a "detention" or "diminution," the plaintiff must prove the defendant's use to be unreasonable; if defendant has "diverted" the water, the plaintiff need only show that the use is adverse, though perhaps reasonable. If the defendant has "obstructed" the water, the plaintiff must show adverse use plus material injury. When the defendant has "polluted" the water, the plaintiff must prove adversity, material injury, and a lessening in value.

Despite these technicalities, however, the Georgia courts have developed a judicial law of riparian rights similar in most aspects to the law as developed in the more typical common law jurisdictions. Thus, in one of the first cases decided after codification, rather than be drawn into fine distinctions based on the wording of the above statutes, the supreme court simply held that the statutes restated the previously existing common law principles (83). It is to the Georgia case law, then, that we must turn.

Georgia's definition of a watercourse is not noticeably different from that of other riparian jurisdictions. A watercourse is a stream of water with a defined channel and banks, although it is not necessary that water flow through the watercourse at all times (84). A more recent Georgia case held that a sand slough with sufficient current to float logs only during six months of the year was a stream (85). While a natural watercourse envisions water flowing as designed by nature, an artificial change in the natural watercourse can become permanent and result in the treating of the stream as a natural watercourse (86).

Although Georgia is a reasonable use jurisdiction, there are few decisions specifically determining what uses are reasonable. Reasonableness of the use is said to be a question of fact for the jury (87), but it is possible to draw some distinctions between different categories of uses, both in terms of the type of use--domestic, irrigation, manufacturing, etc.--and in terms of the use's *impact* on the watercourse--consumptive, obstructive, polluting, etc. Despite the intricacies of section 105-1407, there are Georgia cases applying a general reasonable use analysis to cases involving detention or diminution of water (88), diversion onto a lower riparian's land (89), obstruction causing overflow of an upper riparian's land (90), or pollution (91).

The Georgia decisions approve several types of consumptive uses as being reasonable, depending on the factual circumstances of the particular use. Domestic use is an approved use (92), although, unlike some other riparian states, Georgia has never given domestic use any priority over other reasonable uses (93). Irrigation is also an approved consumptive use, although the only expressions of this are *dicta* (94). Other than these occasional general references to the reasonableness of irrigation, no Georgia case delineates the extent of the right to irrigate with the waters of a natural watercourse. As in most states, nonconsumptive uses are more likely to be approved as reasonable by the Georgia courts. Included within this category are uses which temporarily retard or accelerate the natural stream flow, or which affect the quality or consumption of the flow. In *Pool v. Lewis* (92), for example, a temporary obstruction of flow to allow the defendant to repair his mill machinery was said by the court to allow no cause of action to inure in the plaintiffs. On the other hand, other Georgia cases have found conduct unreasonable which increased the velocity of stream flow by removing a natural obstruction (95); increased the velocity of stream flow by adding other waters (96); injured the plaintiff's land by causing an overflow (97); or polluted waters, thereby rendering the other riparian land less valuable (98).

The Georgia law of remedies contains a few unusual aspects that relate to the possible liability of an on-land application system. As in other riparian states, a potential plaintiff in Georgia could seek either injunctive relief or money damages. To achieve any recovery, the claimant must be riparian with respect to the interest invaded and must show some definite injury or probability of injury. A riparian owner is, in the usual case, an owner of land bounded by a watercourse or lake or through which a watercourse flows. Although Georgia has no case law considering the geographical scope of riparian land, that is, whether it is limited to land within the watershed or whether riparian land once severed can ever regain its riparian status, the Georgia cases broadly include the owners of any interest in land, including tenants at will (99) and individual joint tenants (100), as potential plaintiffs.

The first unusual aspect of Georgia's law of remedies is that, commencing with the case that is the state's source of riparian water law, *Hendrick v. Cook* (76), Georgia has held that injury to a present use of water is not a necessary element of a plaintiff's cause of action. Rather, relief can be had for harm to a right to future use. Thus, in *McNabb v. Houser* (101), the Georgia Supreme Court enjoined a miner from diverting a substantial part of a stream's flow, which was alleged to harm the plaintiff's downstream mill. Although the defendant argued--and offered to prove--that the amount of water diverted did not harm the plaintiff's present use of the stream and that the plaintiff did not complain when the defendants were constructing their ditch at great expense and with the plaintiff's knowledge, the court said that these considerations were irrelevant and that the technical trespass warranted the grant of injunctive relief.

This protection of possible "future uses" means that a plaintiff could recover damages or even obtain injunctive relief in the absence of any proof of a present injury. This rule, although more consistent with the natural flow rather than the reasonable use theory, remains firmly implanted in the Georgia case law, despite abundant scholarly criticism (102). There are many examples of injunctions as well as money damages being granted to protect rights to future use (103), which, of course, broadens a water user's exposure to potential liability.

Several other aspects of Georgia's law of remedies are worthy of brief mention. Two factors that limit possible liability of water users are that Georgia cases establish a strict standard for proof of causation of the plaintiff's harm by the defendant, and where the defendant's alleged conduct involves pollution, section 105-1407 (81) of the statutes clearly requires proof of a lessening in value of the affected property. This statutory requirement will also tend to minimize claims of interference with vested rights to future use allegedly caused by pollution, because the interference will have to be tied to a *present* lessening of property value.

On the other hand, increasing the possibility of a water user being subject to injunctive relief--rather than just money damages--is the fact that the Georgia cases appear to reject two of the strongest defenses against possible injunctive relief--the doctrines of "balancing of the equities" and of "laches."

Although there are not any specific holdings rejecting the balancing of the equities doctrine, the Georgia Supreme Court, in supporting a grant of injunctive relief, said in 1919:

> It would seem to be a misapplication of the doctrine to deny one his equitable rights solely upon the ground of inconvenience to the opposite party or to the public. Neither the opposite party

> nor the public has the right, legal or equitable, to invade the clear legal rights of another. (104)

This language, although not delivered in a factual context directly similar to our typical situation, indicated rather clearly that typical "equitable" factors, such as the economic status of the parties and the community, were irrelevant once a plaintiff established a right to an injunction. The Georgia courts have never repudiated or significantly qualified this position, although there are occasional cases in which injunctive relief has been denied.

Any infringement with a plaintiff's water right in Georgia is compensable in a suit for money damages by a least nominal damages. In addition, however, any consequential damages that flow from the offending conduct are also recoverable. As is the case in most riparian jurisdictions, Georgia follows the rule that for permanent and non-abatable harm the measure of damages is the decline in market value of the affected land (105); and for continuing, but abatable harm, the proper measure of damages is the loss of rental value (106). Specifically, items for which recovery has been allowed have included expense incurred in minimizing harm to the plaintiff's property, the value of lost crops, and annoyance and discomfort. It is generally said that a plaintiff has no duty to mitigate his harm, and if the defendant's conduct causes an increase in the value of the plaintiff's property, the defendant cannot use this to offset the harm caused by the nuisance, although in such a case the plaintiff, of course, cannot recover for decline in market value (107).

### Implications for Land Application Systems--

The Georgia law of natural watercourses does not distinguish between the different types of land application systems. The law is concerned instead with the effect of any proposed use on the quality and quantity of the water flowing in a natural watercourse, and on the uses that may be made of that water by other riparians.

With regard to the possibility that an application system will interfere with the flow of a watercourse, Georgia law has generally favorable implications. A land application system, unlike more typical methods of irrigation, would probably be considered "nonconsumptive" in Georgia; and uses bearing such a label are more likely to be held to be reasonable.

Relative to the possibility of trace contaminants draining into a natural watercourse, it is clear that there can be liability in Georgia for the pollution of the waters of a natural watercourse. This can occur even with a use that is "reasonable;" it being recognized that even reasonable uses may harm other interests and should compensate those harmed as part of the cost of operation. Although, in theory, an injured downstream landowner could receive either money damages or an injunction as relief, the likelihood of either type being awarded is remote. It should be noted, however, that due to the unusual aspects of Georgia's law of remedies, money damages and/or injunctive relief, while a "remote" possibility, are slightly more likely to occur than in other riparian states.

If the land application system is being carefully operated, and the only pollutants returning to natural watercourses are those unavoidably remaining after application, then it is unlikely that the entire application system would be enjoined from further operation. Since Georgia has not specifically approved the balancing of the equities doctrine, it is possible that a Georgia court could refuse to consider, in an action for an injunction, all the facts relating to the reasonableness and usefulness of the application system. Given the express regulatory approval of such systems, however, such judicial obstinance seems unlikely.

Claimants seeking money damages instead of an injunction would find that relief easier to obtain. This is particularly true in Georgia, where, unlike most riparian states, relief is allowed for harm to a possible future use of water as well as harm to a present use. The possibility of such relief, however, is limited by several factors. First, the right to sue for harm to a watercourse is limited under Georgia law to persons owning an interest in land adjoining the watercourse. Second, the landowner who brings suit must prove actual harm to the water that affects the market value of his land. In the case of mere trace pollutants such a showing will usually be difficult, if not impossible to make. And finally, any possible recovery of damages will be limited to the proven decline in the land's market value, which in a rural area will not often be a large amount.

There is no way the system's operators can totally eliminate the possibility of liability for trace pollution of a natural watercourse. Even if all necessary permits under Georgia law are secured, these permits do not shield the operator from possible liability. The steps outlined in the section of Volume I of this report dealing with natural watercourses in riparian states and for Arkansas can be taken to further minimize the possible risk. In addition, operators of land application systems must comply with the "Criteria for Wastewater Treatment by Spray Irrigation" established by the Environmental Protection Division, Georgia Department of Natural Resources (108), for controlling wastewater disposal by spray irrigation. Although such compliance does not insulate the operators from all liability, proof of compliance with the state's regulatory standards would be strong evidence of reasonableness of the operation in any lawsuit.

## Law of Surface Waters

### Description--

The Georgia law of surface waters can best be understood by considering it in three parts: (1) cases involving interference with natural flow, either acceleration of flow by an upper landowner or obstruction of flow by a lower landowner; (2) cases involving pollution of surface waters; and (3) cases involving the right of a landowner to appropriate surface waters on his land for his exclusive beneficial use. As in other riparian states, most of the law in this area is judicial, and most of the reported decisions involve the first category.

Interference with Natural Flow--Although one early supreme court opinion, emphasizing a need for land development, applied a version of the common enemy rule, Georgia, before the end of the nineteenth century, expressly adopted the civil law doctrine under which each landowner is obligated to receive only the natural drainage from higher lands (109). Under this view, the upper landowner cannot increase the flow of surface water by artificial means, and the lower landowner, in turn, cannot obstruct the natural flow by artificial means. The lower landowner's duty is limited to receiving the natural flow *only;* the theory being that a person who profits by improving his land should bear the cost thereof, including the cost of any harm caused to adjoining landowners by artificial alteration of the natural flow of surface waters.

This basic civil law view remains the Georgia law, and remains remarkably free of qualifications, unlike the situation in other former civil law states. Although there are two opinions that could be read as impliedly adopting a reasonable use analysis (110), most Georgia cases consistently hold that, regardless of the reasonableness or usefulness of his purpose, an upper landowner who increases or alters the drainage is liable to the lower landowner for any damages caused (111). Thus, even minor matters, such as landscaping or construction of a driveway, have been the source of legal liability where they altered the patterns of surface water discharge over lower lands. The supreme court recently reiterated the other side of the civil law rule, that the lower landowner may not obstruct the natural flow.

Given this firm insistence on the civil law rule, it can clearly be said that if an on-land application system altered surface water patterns by accelerating flow to lower lands or obstructing flow from upper lands, there would certainly be liability under Georgia law.

Pollution of Surface Waters--Although there are no Georgia state cases directly in point, the usual rule in other riparian states is that a landowner can be liable for polluting diffused surface waters to the same extent that he can be liable for polluting a natural watercourse. There is one Federal decision relating to Georgia which supports this analysis (112), and it seems likely that any pollution of surface waters could incur liability in Georgia, but only under a reasonable use analysis.

Appropriation for Beneficial Use--Even though the authority is scant, it appears to be the rule in Georgia, as in most other states, that the possessor of land has an absolute right to appropriate to his own use all surface waters coming onto or found on his land. There is a statement in *Phinizy v. City Council of Augusta* to the effect that "...the surface water which falls from heaven over land and has not got into a stream, belongs to the owner, and he can use it or turn it at his pleasure" (113). Although his statement was not necessary to the holding of the case, it probably still reflects the Georgia law. The lower landowner's servitude or duty to receive the natural flow from the upper land does not include a reciprocal right to insist on the continuation of the flow against the wishes of the upper landowner.

Implications for Land Application Systems--

The Georgia law of surface waters makes no distinction between the several different types of land application systems. Georgia's law in this area is sparse, and is primarily concerned with the right of one landowner to discharge surface waters across the land of another. The Georgia law has extremely favorable implications for land application systems in situations where both pollutants and diffused surface waters are retained at the application site. It has somewhat less favorable implications when both substances are dispersed to adjoining lands.

In the instance of trace pollution of surface waters crossing the lands of another person, Georgia has no law directly on point. If the civil law view of preserving the natural state of affairs were applied literally in the pollution context, it would mean that every instance of trace pollution would be enjoinable. In no riparian state, however, is the rule so applied. Even states like Georgia, which adhere to a relatively pure civil law rule for issues involving *dispersal* of surface waters, indicate that *pollution* of those waters is governed by the analysis applicable to pollution of natural watercourses. In Georgia, this would probably be a rule of "reasonable use." Since land application systems are reasonable uses in Georgia, this means that it is very unlikely that a land application system would be prevented from operating because of trace pollution of surface waters. The system operators might have to pay for damages caused to adjoining land owners, but the possibility of such liability is even less likely in the surface water category than it is in the natural watercourse category.

There is no possibility of liability for interference with the flow of surface waters if the system collects both surface waters and trace pollutants on its property. As the lower landowner does not have any "property" right to surface waters, he cannot insist on their continued flow. The upper landowner--in this case the land application system--can with impunity collect all surface water on its property.

Given these basic principles, the recommendations for land application systems found in the surface waters sections for riparian states in Volume I of this report and previously made for Arkansas apply to Georgia. In addition, specific requirements, such as the following, found in the Georgia Department of Natural Resourses "Criteria" (108) will control the impact of land application systems on surface waters:

1. Grades on spray fields are limited to a maximum of 15 percent sodded or crop areas and 30 percent for forested areas (114); and
2. Buffer zones around application sites must be provided, thus minimizing the impact of surface waters on adjoining lands (115).

In addition, dikes or ditches should be constructed around spray fields to contain the discharges within the system's perimeter, with the intercepted runoff then returned to a holding pond.

## Law of Groundwater

Description--

Groundwater located in underground streams is treated as part of a "natural watercourse" by Georgia law. All other groundwater is commonly grouped together and called "percolating" waters. Georgia law contains a sharp distinction between the *use* of percolating waters and the *pollution* of such waters.

As far as *use* of percolating waters is concerned, Georgia originally followed the rule of absolute ownership. In *Sadler v. Lee* (116), the Georgia Supreme Court broadly stated that percolating water "...which ... filters from the land of one proprietor into that of another, gives the latter no rights thereto which the law can recognize" (117). This flat statement of absolute ownership was somewhat qualified in later cases. In *Saint Amand v. Lehman* (118), the supreme court recognized that the rule of absolute ownership did not apply where the defendant acted out of malice in wasting or diverting percolating waters; and in *Stoner v. Patten* (119), the supreme court reiterated that injury to subterranean water by a landowner doing lawful acts on his own premises was not entitled to redress unless either the injury was caused by malice, or the underground water was a well-defined stream. Finally, the distinction between a stream and percolating water was emphasized in *City of Atlanta v. Hudgins* (120), which held that, while an owner of riparian land had a right to the flow of the watercourse subject to reasonable use by upper riparians, he had no legal complaint if the upper landowners disturbed subterranean waters *before* they reached the stream, even though that caused the stream to stop flowing.

Thus, as far as use of percolating waters on a landowner's land is concerned, Georgia cases have adopted a rule of absolute ownership subject to a least three qualifications: (1) the use must be "lawful;" (2) the landowner must not be actuated by malice; and (3) the waters must not be part of an underground stream. Although these factors necessarily impart elements of reasonableness to the analysis, the Georgia cases stopped short of adopting the reasonable use rule applied in the case of interference with the waters of a natural watercourse. Although these cases leave the status of groundwater use in an uncertain state, in the case of major users of water this state of uncertainty has been alleviated by the passage of the Groundwater Use Act of 1972 (121).

After defining "groundwater" to include both underground streams and percolating waters, and distinguishing between consumptive and nonconsumptive uses (122), the Act authorizes the Environmental Protection Division of the Georgia Department of Natural Resources to enact regulations concerning timing of withdrawals from groundwaters, abatement of saltwater encroachment, well depth, spacing controls, pumping levels, etc. (123). It is specifically provided that persons withdrawing in excess of 100,000 gallons of water daily need a permit from the division, which shall be granted when sufficient evidence is provided that the withdrawn water is not consumptively used (124). The division, in adopting regulations and in considering permit applications, is required to consider a variety of factors, including the number of persons using an aquifer, the nature and size of the aquifer, the physical and chemical nature of any impairment of the aquifer, etc. (125). Except for particular parts of the Act, such as those regarding well spacing, that may affect incidental uses of groundwaters, the Act's permit process will almost certainly not apply to any conceivable on-land application system, since none draw groundwaters in amounts even approaching the statutory limits. Thus, for our purposes the Groundwater Use Act will not affect or alter previous Georgia law relating to groundwater use.

The 1972 Act also has no effect on previous Georgia law concerning *pollution* of groundwater. Many states, including Georgia, distinguish use of groundwater from pollution of groundwater. A state which follows a modified "absolute ownership" view regarding use of groundwater could adopt any of three theories regarding pollution of groundwater: (1) that pollution was exempt from legal redress to the same extent that use was; (2) that there could be liability for pollution where it was caused by negligence, even though there was no liability for negligence in connection with a use of groundwater; or (3) that a landowner would be strictly liable for harm caused by pollution of groundwater. The Georgia decisions appear to adopt the second of these possible views. In *North Georgia Petroleum Co. v. Lewis* (126), the plaintiff sued for damages assertedly caused by the contamination of his wells from leakage of the defendant company's oil storage tanks. The defendant appealed from a verdict for the plaintiff, arguing that the plaintiff could not recover for mere negligence, absent malice or proof that there was an undergound stream with defined boundaries. The supreme court, however, rejected the argument, noting a distinction between volume of use and contamination, and held that a landowner putting his land to a reasonable use can be liable to a neighbor for pollution of percolating water if he has been guilty of negligence. The court noted that: "At least 21 states have recognized that contamination of underground supplies of percolating water ... render (sic) the person responsible liable in damages to the aggrieved landowner" (127). Although the court failed to note that some of those states based liability on negligence and others on strict liability, it seems reasonably clear that the Georgia court based liability on the theory of negligence. Since, however, the evidence in the case showed no specific acts of negligence, beyond the bare fact that the company's tanks leaked and that the company was unable to cure the defect, it may be that there would be little difference in result, in Georgia, if a theory of strict liability for pollution of percolating waters was adopted.

In any event, it is clear that liability could occur under Georgia law if an on-land application system caused the pollution of percolating waters. It is most probable that liability would be based only on theories of negligence or nuisance, under either of which the reasonableness of the alleged offending conduct would be relevant. In addition, other limitations on recovery discussed in connection with Georgia's law of natural watercourses, such as the plaintiff's obligations of proof, are equally applicable to a lawsuit involving percolating waters.

### Implications for Land Application Systems--

The Georgia law of groundwater does not distinguish between the different types of land application systems. Instead, the law is primarily concerned with landowners' competing rights to use such waters, and secondarily with the consequences of pollution or corruption of such waters.

With regard to the possibility of trace contaminants reaching groundwater supplies, Georgia law has reasonably favorable implications for establishment of land application systems. Since Georgia does not apply the reasonable use rule to groundwater other than that located in underground streams, the legal analysis in this area is somewhat different from the principles applied to natural watercourses. The differences, however, tend to make liability even less likely than in the natural watercourse area. Although Georgia no longer applies a strict absolute ownership rule, which would be the best rule from the viewpoint of a potential defendant, its modifications of this rule do not increase the risk of liability for a well operated land application system. In the absence of malice, liability for pollution of percolating waters is possible in Georgia only in the case of provable negligence.

In addition, many of the practical limitations on lawsuits involving asserted harm to natural watercourses also apply in this area. Only affected landowners could sue, not the general public. Those landowners would have to show that the system polluted a groundwater supply, that they were drawing from the same groundwater supply, that the polluted waters they drew harmed their land, and the specific decline in market value of the land. Although the same remedies are available as in the natural watercourse area, again an injunction is unlikely to be granted against a reasonable use, and money damages will be difficult to prove and will, in any event, be limited to a decline in market value.

If an adjoining landowner complains because, in the absence of pollution, groundwater recharge from an application site raises the water level of the groundwater, he will have an even more difficult time in attempting to sue the system's operators. There are no Georgia cases allowing recovery by the landowner if there is no provable negligence in the operation of the system and no intentional harm being done.

In addition to the precautionary steps outlined in the law of groundwater section of Volume I of this report pertaining to riparian states and Arkansas to minimize the possibility of liability, several sections of the Georgia Department of Natural Resources' "Criteria" (108) pertain to groundwater supplies and must be observed:

1. Irrigation fields, in most cases, must be limited to sites where the maximum elevation of groundwater will remain at least 5 feet below the surface of the land, before irrigation (128);

2. Spray irrigation should normally be carried out only one day a week on a given parcel of land (129);

3. The application rate should be limited to not more than 2 1/2

inches per week and 1/4 inch per hour, in order to prevent compaction of fine soils, damage to crops being sprayed, and excessive ponding (129); and

4. Groundwater monitoring is required in the area of the system, including parameters such as total nitrogen (including organic nitrogen, ammonia, and nitrates), total phosphorus, heavy metals, chlorides, sulfates, suspended and dissolved solids, alkalinity, hardness, and pH (130).

## Summary

Unlike most riparian states, Georgia has specific guidelines, "Criteria for Wastewater Treatment by Spray Irrigation," promulgated by the Department of Natural Resources for controlling certain methods of on-land application of wastewaters (108). The "Criteria" applies only to the disposal of domestic sewage and to spray irrigation. Spray irrigation is defined as the controlled discharge of treated wastewater by spraying onto land to support plant growth (131).

Department of Natural Resources engineers use the "Criteria" as guidelines in determining whether to approve particular spray irrigation systems. Because it is recognized that the state-of-the-art for design and operation of land disposal systems is developing rapidly, the "Criteria" is intended to be flexible, and, as a consequence, frequent revisions may become necessary as more is learned on how the various systems perform in Georgia climate and soil (131). Several revisions have been made in the "Criteria" over the past few years.

The "Criteria" is divided into six sections that pertain to procedures for approval, engineering report format, engineering design guidelines, plans and specifications, operation and maintenance, and monitoring requirements. The most extensive section relates to engineering design guidelines, which impose numerous requirements. All domestic wastewater must receive biological treatment and disinfection prior to disposal (132) and a holding pond must be provided with capacity to store at least 12 days of wastewater flow. The pond must have a high water alarm, and only treated wastewater may be discharged into it (133). Also provided in the engineering design guidelines is the application rate. This rate may not exceed 2 1/2 inches per week, and to prevent damage to crops being sprayed and compaction of fine soils, it may also not exceed 1/4 inch per hour. In addition, it is generally stated that spray irrigation should normally be carried out only one day a week on a given parcel of land, allowing 6 days between applications for the soil to dry out and reaerate; and that, as a consequence, sufficient acreage must be available to permit discharge to each section on only one day a week (129). Grades on spray fields are limited to 15 percent grade for sodded or cropped areas and 30 percent grade for forested areas (114).

The engineering design guidelines also contain a number of specific requirements relating to distribution of effluent, use of fixed and movable distribution systems, freeze protection, pressure and velocity, malfunction controls, and use of sprinklers (134). Also included within the design guidelines are provisions relating to underdrains, maintenance of buffer zones, and protection of groundwater (135). Adjacent land must be protected from odor and blowing spray, and where one of the neighboring land uses is domestic housing, screening areas and buffer zones at least 300 feet wide must be established to prevent spray from reaching residential land (115). For protection of groundwater, the design guidelines require the submission of information on groundwater patterns in the spray irrigation area, including the depth of the water table, variation in depth throughout the site, direction of groundwater flow, and seasonal variations of depth. It is further provided that, in most cases, spray irrigation fields will be limited to sites where the maximum elevation of groundwater will remain at least 5 feet below the surface of the land (128).

Operation and maintenance requirements are less extensive than the engineering design criteria. Basically, the owner of the system must prepare a complete operation and maintenance manual for the treatment system and have it approved by the Department of Natural Resources' Environmental Protection Division prior to initiation of operation of the system. This manual must be developed for both the pretreatment process and the irrigation system and should describe the harvesting scheme, procedure of inspecting and cleaning the sprinklers on a routine basis, irrigation during adverse weather or high winds, monitoring programs and procedures, and other items pertinent to management of the system (136).

The monitoring requirements demand the establishment of a system for monitoring the wastewater treatment facility, the groundwater in and around the site, the soil and vegetation within the site, and any surface waters recharged by the groundwater from the site. Direction of groundwater flow and the location of natural discharge points determine the danger to other groundwater users in the area and the placement and number of groundwater quality monitoring wells. A minimum of one shallow well upgradient or otherwise outside the influence of the site is required in order to determine the effect of the irrigation system. In addition, a minimum of one shallow well within the site and two wells downgradient of the site are required (130).

Certified reports of chemical and bacterial analyses are required to be submitted before commencement of the spray irrigation system, and must thereafter be submitted on either a quarterly or monthly basis. The quarterly samples must include analysis for total nitrogen, suspended solids, pH, and fecal coliform. Total phosphorus, chlorides, dissolved solids, potassium, and heavy metals must be monitored on a monthly basis. Additional parameters may be required on an individual project basis (130).

Finally, the "Criteria" provides that the Georgia Water Quality Act (137) and Rules and Regulations for Water Quality Control (138) govern the procedures for submitting plans and specifications and gaining approval of them for establishing land application systems (139). Information required to be submitted in the two-phase engineering report comprising the plans and specifications include general climatological data; a description of the general topography, geology and soil types; depth and general quality of groundwater; general land use; design criteria; results of soil boring tests to determine percolation rates; and data on water and nutrient balance to determine application rates (140).

The combination of Georgia's specific regulatory guidelines and underlying water law are not as favorable to on-land application systems as those found in some other riparian states. Stringent requirements in the Department of Natural Resources' "Criteria," while less restrictive than the Arkansas administrative regulations and informal guidelines, would certainly have a tendency to discourage wide use of land application systems. Turning to Georgia's basic water law, which continues in substantial force despite recent statutory enactments, we find that it is not particularly receptive to changes in water use patterns. In the natural watercourse area, the ability of a plaintiff to obtain injunctive relief without proving injury to a present use and without consideration of the comparative equities of the parties raises a small but definite worry for any innovative program. In contrast, the Georgia law as it relates to percolating waters is favorable to land application systems, with Georgia's recent tendency to increase regulation of its groundwater supply directed primarily at massive consumers, such as pulp and paper mills. The surface water decisions, however, like the natural watercourse decisions, are occasionally unfavorable, at least as compared to decisions in other riparian states. The civil law view, which Georgia strongly follows, is the most restrictive possible rule from the view point of an on-land application system.

Yet none of these problems are fatal, or even significantly harmful, to on-land application programs. They just raise small but definite risks if a fact situation, arising in Georgia, produced: (1) a system that caused some pollution or other interference with water patterns, (2) a litigious plaintiff who could prove decline in market value of his land, and (3) a judge with a hostile or thoughtless attitude toward an innovative use of effluent.

## KENTUCKY

Kentucky is a reasonable use riparian state, without regulations directly pertaining to land application systems. What makes Kentucky law worth noting are its rigorous application of the doctrine of sovereign immunity, and its stringent standards of proof for recovery in a case involving alleged pollution. These strong defenses make liability an even less likely possibility than in most other reasonable use riparian jurisdictions.

Kentucky is one of the few jurisdictions that has specifically held that a common law action of nuisance will lie in a case of alleged water pollution even though the defendant has all necessary discharge permits (141). The many defenses available to such a suit, however, make it very unlikely that a well operated land application system could be found liable.

Insofar as the systems will be implemented by public bodies, the doctrine of sovereign immunity applicable in Kentucky will mean that the system operator cannot be sued without its consent unless a landowner's property is damaged to such a severe degree that it is considered to have been taken without just compensation within the meaning of the United States and Kentucky Constitutions (142). Only where private property is taken for a public purpose, or where there is a trespass thereon which amounts to such taking, is the state's immunity waived by sections 13 and 242 of the Kentucky Constitution (143). A trespass amounting to a taking is:

> ...an interference with the legally protected use to which land has been dedicated, which destroys that use or places a substantial and additional burden on the landowner to maintain that use.... (144)

It is apparent that such a substantial interference with another landowner's rights is extremely unlikely to occur from the sort of trace discharges usually associated with land application systems.

Apart from the possible application of the sovereign immunity defense, it is a well established rule in Kentucky that the owner of upper land is liable for resulting damages to the lower land if he pollutes the stream or injures the land through which it runs (145). In *Nebo Consolidated Coal & Coking Co. v. Lynch* (146), the Kentucky Court of Appeals (the Court of Appeals became the Kentucky Supreme Court on January 1, 1976) held that where a mining company created a nuisance by placing slack and copperas in and near a watercourse, so that such substances were carried to the lands of a lower proprietor, rendering the land unfit for cultivation, it was no defense that the proprietor did not object to the opening of the mine. Hence, the failure of adjoining or other riparian owners to object to the land application systems will not preclude their later recovery for damages resulting from pollution (147).

However, it is doubtful that the trace contaminants carried from land application systems would cause sufficient damage to lower agricultural lands to invoke liability since, unlike the pollutants in the mining cases that frequently occur in Kentucky, the effluents involved in the land application projects will have been treated. It is possible that the lower owner may even benefit, or at least receive no negative effect, from any residual wastes.

In addition, a landowner may not recover from even a polluter unless damages are proved. In *Chapman v. Beaver Dam Coal Co.* (148), the court held that where there was a lack of proof of past or present damages to a farmer's land resulting from the discharge of poisonous materials from a strip mine operation into a creek that ran over the plaintiff's land, and no reasonable certainty of future damages, the plaintiff farmer was not entitled to damages or an injunction prohibiting discharge into the creek. The judge admitted that water highly impregnated with copperas, slack, and other poisonous matter from a mine will injure land use for agricultural purposes, but concluded from the evidence that the plaintiff's farm was still as productive as ever. Since it could not be determined when and if the land's productivity would diminish as a result of the pollution, no damages could be awarded and no injunction could issue.

Certainly when damages are awarded the nature of the land or water before the pollution complained of occurred will be relevant in determining fair market value (149). The previous integrity of the waters is also relevant in determining whether injunctive relief is appropriate. In affirming the injunction and damages award in the case of *Perry v. Simpkins* (150), it appeared that a significant consideration in the court's decision was the fact that prior to the defendant's discharge of pollution, the stream was clear and free of any harmful substances.

However, looking to the previous character of the water produced an opposite result in *Kevil v. City of Princeton* (149). There the court held for the defendant because the water was already contaminated by prior pollutants so as to render it unfit for the plaintiff's purposes. Therefore, the plaintiff, operator of a waterworks plant, suffered no substantial loss by the city's act of emptying sewage into the spring which flowed underneath the plaintiff's plant.

It follows that recovery of damages should be limited strictly to injury caused by the pollution of the party defendant (151). Further, every element of damages for pollution which existed at the time the plaintiff purchased the land must be eliminated from any recovery in his or her favor. For the most part it appears that injury amounting to a taking could not occur from the drainage of trace contaminants in agricultural areas.

## MASSACHUSETTS

### Law of Natural Watercourses

Description--

Massachusetts is a riparian theory state (152), with the law stating that the owner of land adjoining a natural watercourse has the right to reasonable use of the water (153) and its free and unobstructed flow (154). The definition of a natural watercourse was stated in a recent case:

> ...it must be made to appear that the water usually flows in a certain direction, and by a regular channel, with banks or sides. It need not be shown to flow continually; it may be dry at times, but it must have a well defined and substantial existence. (155)

A small, well defined ditch which had been in use for over 20 years was found by the Massachusetts Supreme Judicial Court to be a natural watercourse with the attendant rights of flow to the landowner that prohibited the ditch's obstruction by the adjoining landowner (156). Thus, if any land application system causes either any runoff or, the opposite problem, a decrease in flow, into streams or other bodies of water or ditches which fulfill the Massachusetts definition of natural watercourses, the system operators must be ready to deal with the problems that the effect of the decrease in flow, or the runoff, might produce on natural watercourses.

First, will land application of wastewater insofar as it uses or may use the waters of a natural watercourse, be construed as a reasonable use of the watercourse by an upper riparian owner? The exact definition of "reasonsable use" has been unclear since the Massachusetts courts began dealing with the concept in *Elliot v. Fitchburg Railroad Co.* (153) in 1852. In that case the plaintiff sued the defendant railroad company for diverting a small brook in order to use the water to service the defendant's locomotives. The court used language that became typical of Massachusetts courts dealing with the question, stating that the defendant:

> ...has a right to a just and reasonable use of it [the water]; and so long as it is not wholly obstructed or diverted, or no larger appropriation of the water running through it is made more than a just and reasonable use, it cannot be said to be wrongful or injurious to a property owner lower down. What is such a just and reasonable use may often be a difficult question, depending on various circumstances. (157)

Traditionally domestic cases were most favored as reasonable, even when extending to use of the entire watercourse (158). While there are few cases dealing directly with irrigation and its status as a reasonable use, several authors think that Massachusetts has given legislative preference to agricultural uses, for example, by its early adoption of statutes exempting small dams (presumably used for farming purposes) from statutes requiring safety standards or permits for dams (159).

Thus, the *use* of the watercourse in connection with a land application system will probably be construed as reasonable under Massachusetts law. It should be added, however, that in Massachusetts, unlike several other riparian states, the reasonable use of the natural watercourse must be made in connection with the landowner's riparian estate and within its watershed. In *Stratton v. Mount Hermon Boys' School* (160), the defendant boys' school was held liable to a lower riparian mill owner for wrongful diversion of water when the school pumped water out of a natural watercourse for its domestic institutional use at a site removed from the stream's watershed. Thus, system planners should be careful not to violate the proposition that the use of the water must be made within its watershed.

Since irrigation will probably be found to be a reasonable use, and since land application systems will be considered to be irrigational in nature in regard to their impact on natural watercourses, the second inquiry will involve whether the land application of wastewaters will affect the natural flow of a watercourse so as to incur liability to lower riparian owners. Total obstruction of the stream is forbidden under Massachusetts law (161), although *Stratton* (160) leaves open the question of whether a landowner could totally divert an entire stream for his own domestic use. In addition, the Massachusetts courts have stated a fairly strict requirement that actual damage must be shown as a precondition to any recovery of damages. In *DiNardo v. Dovidio* (161), the plaintiff landowner sued at law and in equity to force the defendant adjoining landowner to reopen a ditch that ran across the land of both parties. The court denied the request on the ground that the plaintiff showed no actual damage. Similarly, the owner of marshland sued the adjoining defendant for diverting the current of a natural watercourse by putting sand on his beach which the plaintiff alleged caused a "scouring out" of his land in *Nass v. Town of Duxbury* (162). No recovery was awarded, as the court found that the plaintiff had not proven a causal connection between the defendant's action and his injury.

Since it is unlikely that any land application system would totally obstruct the flow of any stream, a more important question involves its possible effect on a stream's natural flow by diverting wastes in such a manner as, perhaps, to interfere with stream flow short of a total obstruction. In this regard, the traditional approach of the Massachusetts courts has been that the intended use of the stream must not "materially" interfere with its flow (163). Recent cases have modified this rule somewhat. For example, in one recent case a plaintiff downstream landowner's suit against a developer was dismissed even though the trial judge found that the developer had reduced the flow of the watercourse by filling what was originally swampy land in order to make it suitable for home development (164). A riparian owner was found to have the right to increase the flow of a natural watercourse in *Myhr v. Vlahakis* (165). The plaintiff's ditch backed up because of the defendant adjoining landowner's inadequate pipes which caused water to seep into the plaintiff's house. The court ordered the defendant to remove the obstructions in his pipes and did not penalize the plaintiff for increasing the flow. Thus, fairly recent Massachusetts decisions have modified the rule of no interference with the flow of a natural watercourse and have used policy arguments to justify both an increase and a decrease in such flow. Since the typical land application system will improve the quality of the water while perhaps decrease the flow slightly, it would seem that the benefits derived from the project would be analogous to the benefits provided by the defendant developer who decreases the flow in order to change the grade of the land and reclaim swamp land for beneficial use at home sites.

A third question regarding natural watercourses and their relation to land application systems is whether trace contaminants which might remain after irrigation and might subsequently drain into natural watercourses would be classified as pollution, and the possible effect of such a classification.

The Massachusetts courts first faced the problem of industrial pollution of water by mills in the early twentieth century. In *Parker v. American Woolen Co.* (166), the court found the defendant company guilty of emptying dyestuffs, chemicals, and industrial and domestic sewage into Beaver Brook. The defendant's actions were found to corrupt the stream to the substantial injury of the plaintiff, who was a lower proprietor, and to make the water unfit for use. The court noted:

> It is true that there is in any large body of water a purifying principle which will, either by ordinary sedimentary deposit or by chemical change, obviate the evil effects which otherwise would arise from the deposit therein of some limited amount of noxious matter. Accordingly it is not for every small deposit of such matter that the law will give a remedy. ...There doubtless must be a material and sensible deterioration of the quality of the water.... (167)

Similarly, the court in *MacNamara v. Taft* (168) enjoined the defendant mill owner from polluting the stream with soap, soda, ash, etc., so that the plaintiff's cows could not drink the water. Citing the reasonable use rule, the court stated that reasonableness was a question of fact. Here, the discharge was found to materially affect the purity of the water, and to be unreasonable, whereas an action which only slightly impaired the quality of the water would be reasonable. The Massachusetts courts have also found that such pollution by an upstream mill owner constitutes a continuing nuisance for which the plaintiff is entitled to equitable relief on the showing of material injury (169). In such an action there are cases indicating that Massachusetts will not allow the defendant to raise the issue of the social utility of its conduct under the defense known as "balancing the equities" (166). However, it appears that all other traditional equitable defenses would be available to oppose an action for injunctive relief (170).

If an action is brought for money damages caused by asserted pollution, it appears that Massachusetts follows the usual rule that for permanent harm the proper measure of damages is the difference in the market value of the affected land (171) and in the case of temporary harm damages will be measured by the loss in use or rental value to the owner, and not be the loss in salable value (172).

While there are no reported Massachusetts decisions specifically considering the problem of trace contaminants from otherwise reasonable uses of land, the emphasis in the reported decisions on the need for substantial pollution before an action will lie indicates that, in the ordinary course of operation, a well operated land application system will not incur too great a risk of liability.

### Implications for Land Application Systems--

As noted, any land application system might either slightly impede the flow of a natural watercourse or drain trace contaminants into the watercourse. With regard to the first possible effect, interference with flow, the Massachusetts law has generally favorable implications. Any of the possible methods of application would probably be defined as "irrigation," and it has been held that irrigation is a reasonable--and therefore permissible--use of the waters of a natural watercourse. Since this conclusion has been stated in situations where the irrigator is diverting the pure waters of a stream, the same conclusion is even more likely where the irrigator is diverting primarily wastes and, as a result, improving the stream's quality.

While a downstream riparian might have a cause of action for a slight diversion of water, in fact the possibility of damages or injunctive relief being awarded against the system operators is quite small. While Massachusetts' failure to apply the doctrine known as "balancing the equities" is troublesome, it is more than offset by the strict requirement of proof of *actual present* harm imposed by the Massachusetts decisions. A technical, fanciful, or even an actual, but minor, invasion of a water right will not give rise to a successful cause of action in Massachusetts.

On the other hand, if after application trace contaminants remain on the land and are eventually washed into a natural watercourse, it is clear that there can be liability in Massachusetts for "substantial" pollution of the waters of a natural watercourse. This can occur even with a use that is "reasonable;" it being recognized that even reasonable uses may harm other interests and should compensate those harmed as part of the cost of operation. Although in theory, the relief an injured downstream landowner could receive could include either money damages or an injunction, in fact the likelihood of either type of relief being awarded is extremely remote. If the only pollutants returning to natural watercourses are those unavoidably remaining after application, then it is unlikely that the entire application system would be enjoined from further operation. Even though Massachusetts does not apply the balancing of the equities doctrine, the requirement of proof of substantial pollution causing actual harm serves the same purposes, in that it insures that reasonable uses causing at most minor harm to another water user will be allowed to continue.

If a claimant sought money damages instead of an injunction, such relief in Massachusetts could be almost as difficult to obtain, since the requirement of substantiality is applied in actions for money damages as well as suits for injunctive relief. The possibility, moreover, is further limited by several factors. First, the right to sue for harm to a watercourse is limited, as in other riparian jurisdictions, to persons owning an interest in land adjoining the watercourse. A person without any interest in riparian land could not sue. Second, the landowner who brings suits must prove *actual* harm that affects the market value of his land. Even if he proves that some pollution is occurring, that is not enough to recover damages; he must show that the pollution is causing harm to his property that affects its market value. In the cases of mere trace pollutants, such a showing will usually be difficult, if not impossible, to make. Finally, any possible recovery of damages will be limited to the proven decline in the land's market value. In a rural area this will not often be a large amount, and as a result grandiose or vexatious claims will be discouraged.

There is no way the system's operators can totally eliminate the possibility of liability for trace pollution of a natural watercourse. However, the steps set forth in the natural watercourse section of Volume I of this report relating to riparian states and for Arkansas can be followed to further minimize any possible risk.

## Law of Surface Waters

Description--

Massachusetts follows the common enemy doctrine of rights in surface waters, which includes rain, snow, and any other precipitation. The landowner has the absolute right either to prevent surface water which accumulates elsewhere from coming upon his land or to alter the course of surface water which has accumulated on his land or come upon his land from elsewhere. In either instance the landowner may permit the water to flow upon the adjoining land of another and cause damages to that land without being held liable (173).

On the other hand, the landowner, if he wishes, also has the right to collect surface water and use it for cultivation or any other lawful purpose (174). The peculiarity in Massachusetts law is that the landowner has this right on the condition that, if the landowner later decides to discharge the previously accumulated surface water, he cannot use any sort of artificial channel. Thus, when the defendant in *Mahoney v. Barrows* (174) collected surface water for use in irrigating his cranberry bog to such a height that it flowed onto the plaintiff's adjoining land, he was not liable since the resultant flow was not through an artificial channel. A similar result occurred in *Maddock v. City of Springfield* (175) when the defendant's building of a sidewalk permitted surface water to accumulate at the rear of his lot and overflow onto the plaintiff's land. Again, the defendant was held not liable because he did not convey the surface water through an artificial channel. The court emphasized that the plaintiff in turn could bar such water from his land, if he wished, under the common enemy doctrine.

This rule of absolute liability for artificial drainage seems to be modified by the opinion of the court in *Chesarone v. Pinewood Builders, Inc.* (176). Although the defendant developer was enjoined for its deliberate action in constructing a surface water drainage system in which water was channeled to be discharged onto adjoining land because of a continuing nuisance, the trial judge stated that there could be factors which would be involved in an alternative method of disposing of water, such as physical difficulty, damage to purchasers of other lots, or grossly disproportionate financial cost, which would constitute special circumstances rendering the injunction inequitable.

The landowner who does not collect or use surface water does have the right to allow the water to drain into a natural watercourse (177). This action is subject to the limitations of reasonable use, and the additional limitations that the discharge should not be beyond the watercourse's natural capacity and that the land of adjoining riparian owners should not be materially injured (178). As in the natural watercourse area, the complainant landowner is required to prove actual damage in all cases involving drainage of surface water (179).

It must be noted that virtually all Massachusetts law involves the diversion or obstruction by a landowner of surface water coming into his land either naturally or from the land of another. There are few Massachusetts cases involving the right of a landowner to lawfully use surface water reaching his property, and no cases involving the discharge, either intentionally or unintentionally, of trace pollutants into surface waters which then flow across the land of another. The first proposition has only been questioned in terms of the surface water reaching another landowner's property by mistake. It is doubtful that lower landowners would have any right to prevent the upper landowner from totally consuming the surface water reaching his property for any lawful purpose. Riparian rights do not attach to surface water until it reaches a natural watercourse, and in riparian theory states, including Massachusetts, there is no cognizable concept of "right" in water which would restrict consumption of surface water on the land where it is found.

The second proposition, pollution of surface water, cannot readily be handled under the common enemy rule or any of its variations, because the common enemy rule is usually applied only to justify obstruction or diversion of diffused surface water. A cause of action for the pollution of surface waters would probably exist, most likely in cases where the contaminants were discharged through an artificial channel onto another's land. Although the test which Massachusetts would apply in such a case to determine the scope of liability is uncertain, it is most likely that the various limitations on possible liability already discussed in regard to trace pollution of natural watercourses would apply.

Implications for Land Application Systems--

From the point of view of the land application system operator, it would seem that Massachusetts law would absolutely allow the retention of surface waters at the application site, under the traditional absolute right of the landowner. If surface waters are allowed to flow off the land containing trace contaminants, care would be necessary in order to ascertain that the flow of any natural watercourses would not be greatly altered and that the water would not be so polluted as to materially injure the adjoining land. This finding would, of course, depend on the particular land application system employed, type of soil, size and type of contaminants present, etc. In general it will be preferable in Massachusetts to contain both surface waters and trace contaminants of the application site, rather than to allow discharge of both surface waters and trace contaminants across the lands of other persons. This is particularly true if discharge would occur through any form of artificial channel rather than by natural structures and gravity.

If trace pollutants did escape from the application site along with surface water, the extent of possible liability would be uncertain, due to the relative lack of pertinent Massachusetts decisions, but it would not be likely to be severe. Since, as is true with regard to natural watercourses, land application systems are reasonable uses, it is very unlikely that a land application system would be prevented from operating because of trace pollution of surface waters. The system operators might have to pay for damages caused to adjoining landowners, but the possibility of such liability is even less likely in the surface water category than it is in the natural watercourse category. This is because, in addition to the requirements of proof discussed previously: (1) the potential claimants for harm to surface water are almost always limited to the immediately adjoining landowners, rather than including all downstream owners as in the watercourse category; (2) the right to use surface water is not a "property" right as is the right to use the water of a natural watercourse; and (3) since less gainful use is generally made of surface water, it is much more difficult for a claimant to prove the loss of a specific use and consequently, a decline in the market value of his land.

If, on the other hand, the system collects both surface waters and trace pollutants on its property, there is no possibility of liability in Massachusetts for interference with the flow of surface waters so long as the accumulated waters are not later discharged, by means of an artificial channel, across the lands of another. It is clear that, as the lower landowner has no property right to the surface waters, he cannot insist on their continued flow. The upper landowner, in this case the land application system, can with impunity collect all surface water on its property.

The recommendations contained in the surface waters section for riparian states in Volume I of this report and for Arkansas apply in Massachusetts.

## Law of Groundwater

### Description--

Very little case law relating to groundwater exists in Massachusetts. A distinction is made between a stream, which is directional and flows within limits or banks, and "percolating waters," which are considered part of the land itself (180). From this distinction it appears that Massachusetts follows the absolute ownership doctrine with respect to percolating waters. One case held that an owner of land lawfully occupies the space above, as well as below the surface, to any extent which he pleases (181). Thus, an owner may dig a well so close to his neighbor's well that he may divert water from it and incur no liability (181). A defendant may also build a reservoir into which waters percolate instead of the water percolating into the plaintiff's older well and also incur no liability (182).

The rule, however, has been qualified in several ways. A landowner will be liable if he diverts percolating water with "mere malicious intent" (181), or where he negligently causes the pollution (183) or total destruction (184) of another's water supply. A recent case indicates that the landowner's right to collect underground water is the same as his right to surface water; the owner can be liable for damages to adjoining land if the water is discharged through an artificial channel, or if the water is artificially detained and backs up on another's land (185).

The most recent case qualifying a landowner's absolute ownership in the percolating water beneath his land is *Gamer v. Town of Milton* (186). In this case, the Town of Milton employed a contractor to excavate in the area of the town pond. In order to complete the excavation, the contractor pumped water from the pond, resulting in a 24-foot drop in the pond's water level, with a commensurate lowering in the area's groundwater level. This lowering of the groundwater caused settlement of and damage to the plaintiffs' homes. In finding the town liable, the court stated that the town should have foreseen the consequences of its pumping, and, therefore, was negligent for not taking proper precautions, such as digging observation wells or using recharge wells. The court recognized the rule of absolute ownership, but stated that the liability lies in the failure to take reasonable precautions to protect the plaintiffs and does not involve questions of the rights of ownership and use of water. Thus, there can be liability where the extraction of percolating water is negligently performed, independent of the use to which the water is put. Conversely, where the extraction of percolating waters is performed with care, and the use for which the extraction is made is lawful and reasonable, there can be no liability.

Although there are no recent Massachusetts cases dealing with pollution of groundwater, the fact that liability has been said to ensue only for negligent or malicious pollution or destruction of a groundwater source strongly implies that trace pollution caused in connection with a reasonable use of the land will not be the basis of any liability without evidence of negligence or malice. Moreover, while there are also no cases dealing with the raising, rather than the lowering, of a groundwater supply, it would seem that the same basic enunciated principles will apply and that liability will occur only for proven negligence or malice causing actual property damage.

Implications for Land Application Systems--

With regard to the possibility of trace contaminants reaching groundwater supplies, Massachusetts law has favorable implications for land application systems. Since Massachusetts applies a modified version of the absolute ownership rule, liability is even less likely than it is under a reasonable use rule. It appears that there will be no cause of action for pollution in the absence of negligence or malice.

If the legal question presented is not one of pollution, but one of groundwater recharge from an application site raising the water level of the groundwater, the complaining landowner will have an even more difficult time in attempting to sue the system's operators. There are no Massachusetts cases allowing any recovery by a landowner if there is no provable negligence in the operation of the system and no intentional harm being done.

To further minimize the possibility of liability for possible effects on groundwater supplies, the steps set forth in the law of groundwater section for riparian states in Volume I of this report and for Arkansas should be followed in Massachusetts.

## Summary

In general, Massachusetts law provides a favorable climate for the development of land application systems. Although the absence of pertinent regulations relating to surface application of wastewaters create some uncertainty regarding legal requirements, the basic water law of Massachusetts in all categories--natural watercourses, surface waters, and groundwater--indicates a receptiveness toward innovative uses of water such as that presented by the typical land application system.

Massachusetts has detailed regulations governing subsurface effluent disposal which are also relevant to those application systems that involve possible drainage into groundwater supplies (187). Even though the title of these regulations relates to subsurface effluent disposal, the statement of policy in the regulations also refers to effluent that enters the ground after application to the soil. Applicants for permits to establish treatment plants that dispose of effluent by applying it to the soil are required to make a geohydrologic study of the proposed effluent site. This required study must include such items as: (1) groundwater elevations; (2) mounding of the groundwater table under the disposal facilities; (3) rate and direction of flow of groundwater before construction; (4) estimated rate and direction of groundwater flow after the plant is at full capacity; (5) probable effect of the effluent on the surrounding area, including public or private water supplies, streams, ponds, and wetlands; and (6) capacity of the aquifer to accept the effluent. In all other respects, these regulations deal with the design and operation of the sewage treatment plants, and not with the method of application of the treated effluent.

## MICHIGAN

Even though the law of Michigan does not differ greatly from that in other riparian states, the importance of the state because of the Muskegon County Wastewater Management System makes a brief analysis of its law worthwhile.

### Law of Natural Watercourses

Michigan is a riparian theory state (188). The Michigan cases define a watercourse as a natural stream of water fed from permanent or periodic natural sources and usually flowing in a particular direction in a defined channel, having a bed and banks or sides, and usually discharging itself into some other body of water (189).

Michigan distinguishes between domestic and artificial uses of the waters of a natural watercourse. Artificial uses are said to be "...those [uses] which merely increase one's comfort and prosperity and do not rank as essential to his existence, such as commercial profit and recreation" (190). Where both of two conflicting uses of water are artificial, Michigan follows the reasonable use branch of riparian law. Where one of the claimants asserts a domestic use, however, Michigan applies the natural flow theory to that use. While an artificial use must meet a standard of reasonableness, a domestic use enjoys a preferred, non-proratable position. It follows, therefore, that an aggrieved riparian who asserted a loss of water for domestic purposes because of upstream diversion for irrigation could assert a "natural flow" cause of action and prevail under Michigan law, without regard to the reasonableness of defendant's conduct. However, what is typically being diverted from natural watercourses by an on-land application system is *wastes*, not water. Therefore, while a downstream industrial user might complain about the loss in flow if that user was not helped by the improved *quality* of the water, such a use is "artificial" and, in the Michigan formulation, stands on only an equal footing with the upstream irrigation use. In such a case the reasonable nature of the irrigation use would be legally relevant and would most likely prevent injunctive relief. Only a domestic user would have a "natural" priority, but such a user would not be using the diverted wastes for domestic purposes in the first place, and would consequently not have any damages sufficient to base a law suit.

Except for this combination of the natural flow and reasonable use theories of riparian law, Michigan, on most other points of the law of natural watercourses in relation to on-land application systems, is a typical reasonable use jurisdiction. Irrigation is a reasonable use of the waters of a natural watercourse, and the factors to be considered in determining the reasonableness of a specific use were recently set forth in *Thompson v. Enz* (191):

> First, attention should be given to the watercourse and its attributes, including its size, character and natural state....
>
> Second, the trial court should examine the use itself as to its type, extent, necessity, effect on the quantity, quality and level of the water, and the purposes of the users....
>
> Third, it is necessary to examine the proposed artificial use in relation to the consequential effects, including the benefits obtained and the detriment suffered, on the correlative rights and interests of other riparian proprietors and also on the interests of the State, including fishing, navigation, and conservation. (192)

There are Michigan cases indicating that there may be liability where a landowner can prove he has been damaged by obstruction (193), diversion (188), or pollution (194) of a natural watercourse. In any such case, injunctive relief of money damages are available remedies to the complaining party. In a suit for injunctive relief, however, Mighican recognizes all the traditional equitable defenses, such as balancing of the equities (195), laches (196), and coming to the nuisance (197).

In a suit for money damages, Michigan follows the usual rule that for permanent damages the proper measure of damages is the difference in the market value of the affected land (198). In the case of temporary harm, damages will be measured by the loss in use or rental value (199).

## Law of Surface Waters

Michigan follows the civil law rule with regard to surface waters. Under this rule, a lower or servient estate owner must accept the surface water from an upper or dominant estate which naturally drains onto his land, but the dominant estate has no right to cast additional waters upon the servient estate in such a way as to cause damage (200).

In a leading case, *LeVan v. Hedlund Plumbing and Heating Co.* (201), the plaintiff sued the plumbing and heating company, who were adjoining landowners, for damages alleging that it had, by depositing large amounts of earth fill on its property, raised the level of its land to a point where it would no longer accept surface waters flowing in their natural course from the plaintiff's land, resulting in damage to the plaintiff's basement and the machinery stored in it. In finding that defendant company was negligent, the court, after citing the general rule, stated that "...the average prudent man possessing knowledge of the natural surface water flow should have known that the raising of defendant's land would cause water problems for plaintiff and failure to provide for this was negligence" (202).

Michigan's reliance on the civil law rule could present problems for an on-land application system that might change traditional surface water flow patterns. A cause of action in nuisance would lie if the on-land application system caused the collection and discharge of surface waters across lands which they would ordinarily not cross, or caused their discharge at an accelerated rate of flow across lands they would ordinarily cross.

It must be noted, in attempting to assess the precise Michigan posture, that virtually all Michigan case law involves *diversion* or *obstruction* by a landowner of surface water reaching his property. There are no Michigan cases involving the right of a landowner to *use* surface water reaching his property. In this regard, however, it must be seriously doubted whether lower landowners would have any right to prevent the upper landowner from making whatever use he pleased of the surface water. Riparian rights do not attach to surface water until it reaches a natural watercourse, and in riparian theory states, including Michigan, there is no other cognizable concept of "right" in water that would restrict consumption of surface water on the land where it is found.

*Village of Sand Lake v. Allen* (203) is the only reported Michigan case involving alleged pollution of surface waters. In that case the plaintiff village sought to enjoin the defendant husband and wife from obstructing the flow of surface water which was diverted through ditches to a nearby lake. The path of this flow crossed the defendants' land. The defendants had constructed a dam blocking the flow of the surface water, alleging that, among other things, the water was polluted causing the defendant wife to become ill. In affirming the lower court's decision for the plaintiff village, the court recognized that although a cause of action exists for pollution of surface water, the defendants had not met their burden of proof. The effect of this early holding is questionable. In view of the fact that Michigan follows the reasonable use theory in other areas of water law, it is likely that any such case arising in the future would be resolved under a standard of reasonableness.

## Law of Groundwater

Michigan has adopted the reasonable use rule to resolve issues concerning subterranean percolating waters. In *Hart v. D'Agostini* (204), the defendants drove well points along a sewer construction trench in order to lower the water level during construction of the sewer trunk line, causing the plaintiff homeowner's well to go dry. In reversing the trial court's decision to award money damages, the Michigan Court of Appeals stated:

> In the case before us the water was not transported to distant areas for consumption, nor was there any evidence of permanent damage to the subterranean water table. Here, water was merely moved out of the area of the public easement in order to facilitate sewer construction. Improvement and reasonable development of the public utility easement required such steps. As to the surrounding areas, it was not unreasonable to have a trunk line sewer buried on a public easement, as such use was intended for the areas when it was platted. Further, the sanitary sewer trunk line benefitted the area as it was so constructed to allow the surrounding homes to attach their sewers to the trunk line. (205).

Since Michigan follows the reasonable use rule with regard to percolating waters, questions of possible liability for interference with such waters will be resolved in accordance with reasonable use analysis as developed with regard to natural watercourses. One further question is whether liability for *pollution* of percolating waters would be governed by the same reasonable use standard as is liability for *excessive use* of percolating waters. This question is not clearly answered by the Michigan case law.

In theory, there can be damages for pollution of percolating waters in Michigan; in practice, liability has been denied in each of the reported cases. In *Upjohn v. Richland Township* (206), a suit to restrain the township board of health from locating a burial place near the plaintiff's home, alleging, in part, that such an action would cause corruption of local wells and contamination of drinking water, the Michigan Supreme Court, in denying relief, held that, where the use of an adjacent premises is proper and non-negligent, liability will be denied unless the injury is positive and substantial. In a more recent decision, *Joldersma v. Muskegon Development Co.* (207), the plaintiffs, a celery farmer and his wife, sought money damages for pollution of their land by salt water which was deposited by the defendant oil company on its own land and which subsequently seeped into the plaintiffs' groundwater supply. In denying recovery, the Michigan Supreme Court said the plaintiffs had not met their burden of proof, even after expert geological testimony that salt water flowing on the surface of the defendant's land would eventually find its way to the plaintiffs' land. The court said:

> It was incumbent upon plaintiffs to establish by some means a relationship between the contents of defendant's sump and their damage. The burden of proof was not met, in view of all the circumstances, by a simple showing that defendant permitted salt water to seep into the ground and that salt appeared at a distance of several hundred feet to the south. It was their burden to establish this relationship, not by a guess of the jury, but by the production of some competent testimony. (208)

In summary, it is probable that liability could ensue in Michigan if an on-land application system resulted in pollutants making their way into a subterranean water supply, although the plaintiff's burden of proof problems would be great. It is also probable that liability would be based only on the theories of negligence or nuisance, which would allow room for proof of the reasonableness of the defendant's use, and not on a theory of strict tort liability.

## Summary

The basic water law of Michigan is not unfavorable to on-land application systems. Statutory requirements are not restrictive to this form of wastewater disposal. The use of the reasonable use rule in two of the three major categories of water, the absence of any theory of strict liability, and burden of proof problems for those alleging damages all serve to create a favorable legal climate for a well operated on-land application system. The only possible problem area is due to Michigan's continued reliance upon the civil law rule regarding surface waters, since on-land application may alter the natural flow patterns of surface water runoff. However, proving more than minimal damages in such a case would be difficult.

Michigan does not have rules and regulations pertaining directly to land application of wastewater; however, the Water Resources Commission has adopted administrative rules that are broad enough to include such disposal systems. Rule-making powers in the general area of water pollution were given to the commission by two sections (209) of the Michigan Water Resources Commission Act (210). The rules most concerned with on-land application are those relating to wastewater discharge permits (211). "Discharge" is broadly defined as "...any discharge or discharge of any waste, waste effluent, wastewater or pollutant, or any combination thereof, into any of the waters of the state or upon the ground" (212). "Waste" is given a similar broad definition that includes "...sewage, garbage ... chemical wastes, biological materials ... and industrial, municipal, and agricultural wastes" (213).

Clearly these definitions are broad enough to cover land application systems as well as more traditional methods of wastewater disposal. The Water Resources Commission Act, however, and the commission's interpretation of its powers under the Act, as evidenced by the administrative rules promulgated pursuant to it, proceed on the assumption that after treatment, all wastes will be either discharged into the waters of the state, or dumped into on-land holding basins, but will not be put to an "affirmative" use. Thus, the commission's rule-making power for effluent standards is limited to establishing "...such pollution standards for lakes, rivers, streams and other waters of the state in relation to the public use to which they are or may be put..." (214).

The administrative rules require a state discharge permit (215). In addition, the rules impose limits on the type (216), quality and quantity of the discharge (217), and require the monitoring, recording, and reporting of discharge quality and quantity (218). Noncompliance with the requirements of these rules or with the terms of a validly issued permit creates a cause of action. Upon the commission's request, the Michigan Attorney General may commence a civil action (219). Discharges which are injurious to public health, safety, or welfare, including specifically the discharge of any raw sewage of human origin, are *prima facie* evidence of the existence of public nuisances and in these instances, the attorney general is empowered to bring a direct action for abatement (220). Application for and compliance with the requirements of a discharge permit issued pursuant to these rules should be sufficient to insulate an on-land application facility from legal liability.

Michigan also uses the land treatment standards set forth in Addendum Number 2 to the Recommended Standards for Sewage Works in the Great Lakes Upper Mississippi River Basin (221) as guidelines only. Data relating to the location of the land treatment facility, topography, soils, geology, hydrology, agricultural practices, and adjacent land use are to accompany the application for an operation permit under the Addendum. Specific standards are suggested for soils, slopes, agricultural practices, hydrology, treatment of the effluent before disposal, piping the effluents to the sprinklers, location of the sprinkler system, surface runoff, fencing, and warning signs. Secondary treatment, or its equivalent, is suggested, and all wastewaters that are spray irrigated should be disinfected according to the Addendum.

## MISSOURI

Operators of wastewater systems in Missouri must be concerned with both the state's basic water rights law and the authority of the Missouri Department of Natural Resources (all functions of the Missouri Clean Water Commission were transferred to the Department of Natural Resources) to adopt pretreatment and effluent regulations whose purpose is to establish criteria for the most effective means of preventing water contamination (222). As part of its program of effluent regulations, the department utilizes a "Guide to Planning and Design Effluent Irrigation Disposal Systems in Missouri" (223), which is aimed at agricultural irrigation as well as simple disposal of effluent.

Irrigation and overland flow methods of land application are "point sources" of effluent discharge, which are defined as any pipe, ditch, or other natural or artificial conveyance (224). An application for a permit must be submitted to the Department of Natural Resources prior to operating any facility that utilizes point sources. A hearing must be held prior to the issuance of a permit to determine compliance with Federal and state standards. Failure to meet the conditions defined by the department may be just cause for denying the permit to the applicant (225).

## Law of Natural Watercourses

In Missouri, as is true of other reasonable use riparian jurisdictions, there is not an absolute right of riparian owners to the flow of a watercourse in a pure and unpolluted state (226). If pollutants discharged into streams result in only minimal pollution of the stream, the proprietor has no cause of action. Only when there has been substantial damage that outweighs the special benefits, if any, that accrue as a result of the upper proprietor's action, will the lower riparian have a right to sue. However, if the riparian brings a suit against the defendant and proves his damage, the burden is on the defendant to prove that its benefits outweigh the damage to the injured riparian.

Since liability will occur only if a nuisance is created, a well run application system will be reasonably insulated from possible liability. Utilization of effluents as fertilizer should not create hazards to riparians if the Federal and state standards are adhered to in the pretreatment process. Trace contaminants should cause little danger to riparian users, because the proportion of the river waters compared to the proportion of the pollutants should be great enough so as not to constitute a nuisance to public health. Liability for creating a nuisance will occur only where the condition of the waterway becomes either a hazard to the health of lower riparians or an unreasonable interference with their desired uses of the waters.

## Law of Surface Waters

Pollution of surface waters which may be deemed unreasonable may constitute a nuisance, and the injured proprietor can sue for damages or an injunction (227). According to Young:

> An owner of land has no right to pollute surface water on his land and to allow it to flow in a polluted condition on the land of an adjoining owner. Such action on his part, in so far as it interferes with the possible enjoyment of the adjoining land, involves the maintenance of a nuisance. (228)

An action for pollution of surface waters will not lie if it does not interfere with the reasonable enjoyment of the land. Where effluent residue is carried off the irrigation site by surface waters, those waters may be virtually unaffected by its pollutants. As mentioned earlier, the quality of the water would probably not be impaired if the Missouri pretreatment standards are complied with. In the case of surface waters, if an instance occurred where the statutory standards were not followed, there might be a greater possibility of injury to adjoining land than in the natural watercourse situation because the ratio of surface waters to the pollutants might not be sufficient to preclude all possible injuries to persons contacting the water.

Thus, Missouri property owners who utilize surface waters reaching their lands would have a legal right to sue for injuries, permanent or temporary, but only where the reasonable use of those waters is impaired. On the other hand, it is not necessary that surface waters be discharged across adjoining lands at all. The general rule applicable in Missouri is that a proprietor has the absolute right to the use of surface water reaching his land and that riparian rights do not attach to such water (229). Therefore, surface water can be retained legally by a proprietor who chooses to do so. According to *Rychlicki v. City of St. Louis* (230), liability for collection and discharge arises not from artificially collecting the water, but rather from discharging the increased volume in a concentrated flow onto the lower land.

It follows that the system operators can legally retain the water at the site to prevent possible pollution of dispersed surface waters. However, the operators must be cautious in their retention methods, because if the waters were to escape in a concentrated volume, liability could then occur if the escape were due to negligence.

Portions of the "Guide to Planning and Designing Effluent Irrigation Disposal Systems in Missouri" (223) are applicable to surface waters. Even though no specific limits on permissible steepness of land are stated, application rates should be compatible with slopes, soil texture, and infiltration characteristics; and land so steep it cannot be irrigated without severe erosion should not be irrigated. Soil types will also be evaluated, with application rates adjusted to fit whether the soil is clay or sandy (231).

## Law of Groundwater

The basic law of Missouri regarding possible liability for obstruction or diversion of subterranean waters is uncertain. There are not any cases in Missouri specifically adopting either the absolute ownership or the reasonable use rule, the two major competing rules. There is one case in which liability was predicated on negligent diversion of groundwater by conducting blasting operations on the proprietor's property (232). By implication it would appear to follow that in the absence of negligence there would be no liability for interference with groundwater. This conclusion, however, has never been specifically stated in Missouri.

Where the question is one of possible pollution of underground waters, the Missouri law is somewhat more clear. In *Chapman v. American Creosoting Co.* (233), the court held that one could not be liable in Missouri for the pollution of a well or spring in the absence of negligence; the rule of liability in the absence of negligence was specifically rejected when the court said it is necessary to prove negligence on the part of the one maintaining a dam for ponding of water on his premises. In the same case, the court also emphasized that permanent damages, measured by decline in the market value of the land in question, would be available only if the well's or spring's beneficial use was totally destroyed; otherwise only temporary damages would be allowed.

This basic principle has been reiterated in other cases. Occasionally, however, the Missouri courts have confused nuisance theory with negligence theory (234), leaving the exact limits of liability somewhat uncertain. Under either theory, however, it is clear that the social utility of the land application system could be proven in order to defeat any attempt to obtain injunctive relief.

Sites should be located in stable geological formations that are not subject to collapse or immediate inducement of effluent to aquifers or groundwater caverns according to the "Guide to Planning and Designing Effluent Irrigation Disposal Systems in Missouri." Hydrologic capabilities, rainfall patterns, and site topography must also be considered (235).

Prior to establishing a land application system, it is recommended that all water wells in the area be sampled for contamination indicators. Afterwards, monitoring is essential in all cases, although the frequency may be less for agricultural irrigation projects than for disposal systems. Monitoring may be done by sampling the drainage water, vacuum lysimeters, or wells. If done by wells, locations, depth, and construction of them is specified by the Department of Natural Resources (236).

### Summary

In general, Missouri's basic water law will present system operators with far less difficulty than the extensiveness and complexity of the Missouri guidelines. Sites according to the "Guide to Planning and Designing Effluent Irrigation Disposal Systems in Missouri" should be located close enough to the effluent source to minimize pumping and pipe costs, and yet be located in an agricultural area that is relatively sparsely populated and likely to remain as such for a reasonable time (237). Effluent samples should be analyzed for total suspended solids (TSS), sodium, calcium, magnesium, electrical conductivity, nitrogen, phosphorous, metal ions, and fluoride. Disinfection should be required of all effluents arising from human sources (238). Extensive guidelines are also included for effluent disposal in relation to soil characteristics (239) and plant characteristics (240), for particular methods of application (241), and for application equipment (242).

## NEW YORK

New York does not have any regulations directly pertaining to land application of effluent. While the basic water law of New York is reasonably clear and not noticeably different from that of other reasonable use riparian jurisdictions, the importance of the state justifies some review of its law on point. In addition, New York law formulates a plaintiff's possible remedies somewhat differently than other riparian states. While the ultimate substance is about the same, the structure is worth examining.

As is true in other states, a land application system might indirectly pollute water sources or inadvertently create a nuisance. Liability for water quality impairment will depend upon whether the water source in question is a watercourse or lake, diffused surface water, or subterranean or percolating water. In New York, however, distinction must also be made between waste discharges into water which interfere with another's *land*, and those discharges which interfere with another's *use of water*. Where the defendant's discharge interferes with the plaintiff's use of water, the plaintiff's cause of action is based on water pollution, involving his respective rights in the use of the water. Where a defendant's discharge interferes with a plaintiff's use of his land, and so "water quality" or "water pollution" is not directly involved, the plaintiff's cause of action would be based upon trespass or private nuisance instead. Thus, a plaintiff may have three possible causes of action when he is harmed by foreign materials discharged into water: (1) trespass on his land; (2) nuisance for interference with the use and enjoyment of his land; and (3) nuisance for interference with the use of his water.

## Discharges of Wastes Interfering with Land

Trespass is the interference with the exclusive possession and physical condition of land (243). Interference is actionable as an intentional trespass if physical invasion occurs, regardless of the harm caused (244). New York courts had no difficulty awarding damages for direct, recurrent, or intentional trespass where sewage effluent piped into a drainage ditch entered the plaintiffs' land causing flooding and rendering the land too soft for plowing or grazing (245). Similarly, the court found a municipal corporation would be liable for trespass whereupon completion of a culvert, surface waters were collected into a single channel and substantially increased the volume of water upon the land of an adjoning owner so that the stream would fill beyond capacity and result in flooding (246). Thus, care must be taken by system planners to retain trace contaminants upon the disposal site as well as avoid constructing any artificial conduits which will discharge an increased volume of surface water upon neighboring land. This potential liability strongly supports limiting implementation of the irrigation methods to spraying or ridge and furrow techniques, rather than flooding where grades would facilitate drainage or the soil porosity is not conductive to rapid seepage. The more elaborate and expensive spraying method of irrigation or the rapid infiltration method would in all probability be most acceptable.

It is worth noting that recurrent trespasses may ripen into a private nuisance. However, unlike the trespass action for nominal damages, substantial harm or interference must be shown before an injunction would be issued restraining annoying activities (247). Thus, it is unlikely that a land application project could be enjoined for causing either minor inconveniences to neighbors or for the mere psychological annoyance of dumping sewage without a tangible annoyance such as the emission of noxious odors.

## Discharges of Wastes Interfering with Use of Water

As previously noted, the potential liability connected with the use of water depends primarily upon the type of water source affected.

Natural Watercourses--

At common law, the use of water for domestic or mill purposes was on a first come, first served, basis. With the industrial revolution, water was consumed and polluted in large quantities, giving rise to the law of riparian rights, whereby riparian owners on a watercourse have equal rights in the water's use (248). A natural watercourse has been defined by New York courts as:

> ... [A] natural stream, flowing in a defined bed or channel, with banks and sides, having permanent sources of supply ... uniform or interrupted ... temporarily diminished or suspended ... [but] usually a stream of running water. (249)

When a natural watercourse exists, riparian owners in New York may jointly and reasonably use it (250). If a watercourse exists, the reasonable use rule applies (251). Thus, a landowner may use water flowing over his premises in a natural stream for domestic purposes, irrigation, and to furnish power for his machinery, provided the amount used is reasonable and not out of proportion to the size of the stream (252). The primary question then is: What is a reasonable use under the conditions and circumstances presented (253)?

Surrounding circumstances such as the size and velocity of the stream, the usage of the country, the extent of the injury, convenience in doing business, and the indispensable public necessity of municipalities for drainage are all factors in determining the reasonableness of a particular use (254). In reviewing the correlative rights of riparian owners, the New York Court of Appeals emphasized that, in the absence of public necessity, it would not relax the general rules governing riparian rights in favor of major industry (255). A lower New York court, reviewing elements of riparian rights, indicated that discharging sewage effluent into a stream when the usefulness of the stream to the lower riparian is impaired, is not unreasonble *per se*. The court noted that while riparian owners do not use the running water, they acquire rights to its reasonable use as it passes by their land. This right is qualified by the rights of others to have the stream substantially preserved in its natural size, flow, and purity and to protect it against material or unreasonable diversion or pollution (256). A lower riparian may also maintain an action against a number of upper riparian owners to restrain them all, although acting separately, from polluting a stream (257).

Thus, an application system might affect the rights in use of natural watercourses in two ways. First, the land application treatment could reduce the artificially increased flow of the stream when wastes are no longer discharged into it; and second, effluents applied to farm lands might reach nearby natural watercourses and increase the flow substantially and detrimentally or carry damaging contaminants, or both. However, trace contaminants carried from land application of wastewater courses may not adversely affect the quality of natural watercourses if properly treated prior to application, thus avoiding liability. Moreover, only the overland flow method and irrigation flooding technique would cause serious flooding problems. Certainly, with proper application no such overflows would occur. In addition, it is likely that application of fertilizer, while arguably of new and extraordinary type, would be considered a reasonable use in agricultural districts.

Diffused Surface Waters--

Diffused surface waters, of greater significance in evaluating the status of land application systems, are defined in New York as all waters from rain, springs, or melting snow which lie or flow on the earth's surface but which are not a part of a watercourse or lake (258). It is well settled in New York that a landowner has the absolute right to use water before it leaves his land. He may appropriate it or discharge it in any fashion, provided only that he does not cast it by drains, ditches, or other artificially constructed conduits upon the land of his neighbor. Surface water may be prevented from reaching a natural watercourse even though such retention may damage commercial users relying on the power source (250). In addition, an owner of either the upper or lower land may improve it and change its grade, thereby altering the flow of surface waters, provided the improvements are made in good faith, and drains, pipes, ditches or the like are not employed (259). This doctrine has commonly been called the common enemy rule (260).

In assessing a proposed land application project under New York law, it seems clear that any measures taken to retain trace contaminants on the disposal or application site, incidentally retaining surface waters, would be a perfectly acceptable and even a desirable practice. Adjoining landowners have no right to receive these diffused waters, nor can they complain that waters resulting naturally from nearby improvements are now flowing across their property. Whether irrigation and cultivation of farm lands qualify as the kind of improvement contemplated as the natural incidence of ownership has not been considered in New York. However, as landowners are not required to maintain idle property in order to protect neighboring premises from the incursion of surface waters (259), it is unlikely that courts will read the rule so narrowly as to exclude irrigation. Nevertheless, the fact that additional quantities of water are being introduced must be noted. Again, the various irrigation techniques and the overland flow and rapid infiltration methods may avoid the dilemma occasioned by a significant increase in the quantity of waters escaping from the premises of an upper proprietor. Certainly, application of effluents to a severely inclined plot descending rapidly to neighboring property or a nearby drainage ditch would be wholly unacceptable. Restrained and calculated applications assimilating rainfall levels or in accordance with outlet capacities or drainage rates should result in little risk of liability.

Acceptable improvements have been the topic of much litigation (261). Artificial concentration and discharge of waters in quantities beyond natural capacity or which would drain elsewhere if left alone have been consistently prohibited (262). In one instance, a municipal corporation was held liable in damages for injuries caused to the plaintiff's premises by sewage brought from sources not draining naturally into surface waters (263). In at least one case, the courts indicated that the mere act of creating a channel which would discharge water onto another's lands constituted an actionable wrong, without demonstrating defective or unsafe construction or maintenance (264). Further, where the state concentrated and channeled surface waters to tax the outlet creek beyond its capacity, liability ensued (265).

Unfortunately, the decisions are not harmonious with respect to the available remedies. Obviously damages, measured by the difference between the rental value with and without the overflow, are available (266). In at least one case, damages were awarded for lost profits (267). Courts of equity may enjoin recurrent discharge of surface waters, although no injunction will be issued where the plaintiff would benefit insubstantially to the greater detriment of the public (268). While this balancing of the equities approach had been rejected previously, recent cases indicate the beginning of a new trend.

Thus, since a land application project would no doubt be characterized as a good faith improvement by one property holder, the incidentally increased flow of surface waters over the lands of another would not be an actionable wrong, irrespective of the damage done. Moreover, restraining waters upon particular locations cannot result in liability. As noted above, care should be taken to avoid construction of discharge outlets and intentionally directed flow, as on a steep incline. These difficulties, while meriting attention, would appear to be easily solved under acceptable engineering standards. Moreover, there is *dicta* in some opinions suggesting that public necessity and insubstantial interference may be permissible excuses for increased surface flow; however, this should not be relied upon as the cases are inharmonious.

Discharges Affecting Subterranean and Percolating Water--

Subterranean waters are generally divided into two distinct classes: (1) underground bodies or streams of water flowing in known and defined or ascertainable channels and courses; and (2) waters which ooze, seep or percolate through earth or which flow in unknown or undefined channels. This secondary category is commonly referred to as "percolating waters." The rights and duties relative to the use of subterranean streams are governed by the same rules as natural watercourses. The owners, like riparians, have equal rights to the use and enjoyment of the water (269). In the case of percolating waters, recent cases have indicated a shift to a similar reasonable use view. A landowner may use percolating waters under his property as he reasonably can, even draining the spring of a neighbor (270). What is reasonable, of course, depends on the facts of each case (271).

The adoption of the reasonable use doctrine for subterranean waters, to be measured by the rights and necessities of others, is a modification of an earlier rule permitting unlimited use of unidentifiable waters (272). Thus, waste committed by one landowner resulting in diminution of flow of water in neighboring springs was forbidden (273). Later, the court, while permitting withdrawal of waters to make ice for personal use upon land, prohibited the sale of such ice, where injury to a neighbor could be demonstrated (274).

Thus, a land application project could be subject to liability for polluting underground waters if contaminants percolated through the earth. Previously, courts were reluctant to find liability for pollution in the absence of negligence and knowledge of the existence of subterranean watercourses, if the business was conducted with care and skill (275). However, other cases indicated that polluters will be held to the knowledge that they could have procured, and certainly are liable, once the pollution has been ascertained (276).

Evaluation of the plans for any land application system should include an assessment of the degree of pollution to underground waters which might result from any of the suggested application techniques. Certainly, the degree of treatment to which effluents are subjected will reduce possible water degradation. Controlled applications might be necessary to permit contaminants which cannot be eliminated to arrive at the watercourse either in a substantially diluted form or to be applied in such a fashion as to permit the waters to fully assimilate pollutants before appreciable impairment occurs, or more contaminants are added. Again, the reasonable use of property under the circumstances must be considered. Arguably, limited water quality impairment is characteristically expected. Precautions should, however, be taken to identify defined subterranean watercourses. Direct pollution of these streambeds has historically occasioned liability, whereas degradation of the elusive percolatory waters has been frequently ignored.

A final, and certainly more theoretical, difficulty with the wastewater application project is the possibility that the water table might rise, interfering with the runoff of surface waters to the injury of neighbors. Again, New York courts have not addressed this issue. Assuming such a chain of events could be proved, it is unlikely that the landowner applying sewage effluent would be liable where such applications were conducted as part of the natural use of his land and were not applied in excessive amounts. The doctrine of reasonable use applies to all activities affecting subterranean waters, and an evaluation would necessarily involve the propriety of the burdens placed on the groundwater in light of the surrounding circumstances. Thus, it is impossible to provide a definitive answer.

## Water Quality Controls

New York statutes and regulations do not directly prescribe standards for wastewater application systems. However, it is the avowed purpose of the New York legislature to safeguard the waters of the state by preventing any new pollution and abating pollution existing already (277). Recognizing that prohibition of all waste discharges is totally unrealistic, New York has initiated the State Pollutant Discharge Elimination System (SPDES) (278), in conjunction with the national program of the same type (279), to establish a permit system authorizing certain discharges into waters of the state (280).

The Department of Environmental Conservation (DEC) has administrative jurisdiction to abate and prevent pollution of waters within the state in accordance with classifications of waters adopted by the department (281). The department may adopt, amend and cancel administrative rulings, hold hearings, and issue permits. Currently, the minimum degree of treatment required for the discharge of sanitary sewage into classified surface waters is effective primary treatment (282). Discharges may not be made without a proper permit (283).

The Environmental Conservation Law has been construed as ancillary and supplementary to other state laws relating to pollution unless directly in conflict (284). They are cumulative and additional to remedies to abate water pollution. Nothing abridges or alters the rights of action or remedies of the state or individuals as riparian owners or otherwise, in the exercise of their rights to suppress a nuisance or abate any pollution now or hereafter existing (285). Thus, assuming a land application system were operating under a SPDES permit or even a Federal permit (NDPES), riparian rights to the continued use of the water in its natural state may require greater care in wastewater application than is initially demanded by the statutory regulations prescribing the manner of application or maintenance of water quality standards (286).

New rights are not created by the Environmental Conservation Law. The right to prohibit pollution and enforce the regulations inures to the state for the benefit of the people. The determination of a violation of the Commissioner of Environmental Conservation creates no presumption or finding of fact inuring to the benefit of persons other than the state (287). An action to abate a public nuisance or statutory violation is reserved to the Attorney General of New York (288). The commissioner is empowered to institute proceedings to compel compliance (289). Civil penalties may be imposed for each day the violation continues (290). Criminal liability may arise for any willful violation of the statutes or of any final determination or order of the commissioner (291). For the purposes of a proposed project, it is probably safe to assume that initial compliance with state official water quality standards will eliminate most risks of potential liability for water pollution.

## Summary

Basically, land application projects may be established in New York, subject to certain qualifications and restrictions depending upon the type of water source affected and the extent of water quality impairment or interference with the use and enjoyment of surrounding property. Notably, runoff of trace contaminants might result in an actionable trespass or continued nuisance depending upon the degree of harm caused. New York follows the "common enemy" rule with respect to the use of surface waters by a landowner, imposing liability only for harm inflicted by artificially discharging water upon the property of another. The reasonable use doctrine applies to the use of both natural watercourses and identifiable subterranean streams, insuring the continued natural flow and purity of waters to the lower riparian owner, subject to reasonable uses made by upper riparians. Thus, a land application system, if operated pursuant to Federal and state regulations for sewage treatment and discharge, having given careful attention to the respective disposal sites, might be profitably implemented in New York.

## OHIO

### Law of Natural Watercourses

Description--

Ohio is a riparian theory state; riparian rights are "property" within the Ohio bill of rights, such that any material interference with those rights causing substantial injury to the owner will constitute a taking of property (292). Ohio defines a watercourse as:

> ...a stream usually flowing in a particular direction in a definite channel having a bed, banks, or sides and discharging into some other stream or body of water. It need not flow continuously, and may sometimes be dry or the volume of such watercourse may sometimes be augmented by freshets or water backed into it from a lake or bay or other extraordinary causes; but so long as it resumes its flow in a definite course in a recognized channel and between recognized banks, such stream constitutes a watercourse. (293)

Ohio basically adopts the reasonable use theory of riparian rights, although there are many conflicting Ohio cases which can only be resolved by an analysis of the historical background of the rule.

The surge of industrial development in Ohio during the latter half of the nineteenth century brought the first great wave of industrial and municipal pollution of the waterways. The courts in Ohio, as well as elsewhere, were inclined at first to be unsympathetic to the claim of an upstream industry that it could develop its business only by discharging its wastes, as an incident of production, into the waterway on which it was located. Courts protected the downstream landowner, frequently a farmer asserting that the water was unfit for his animals to drink, by developing and applying the "natural flow" theory. Thus in *Columbus & Hocking Coal & Iron Co. v. Tucker* (294), it was stated that:

> It is fundamental, we presume, that an owner of land has the right to enjoy the soil itself, in its natural state, unaffected by the tortious acts of a neighboring land owner, and, where the land is located along the margin of a stream, he is, as a riparian owner, entitled, as an incident to his estate, to the natural flow of the water of the stream, in its accustomed channel, undiminished in quantity and unimpaired in quality.... (295)

The court, after considering the claim of the defendant coal company that it had to deposit its coal slack and refuse in the stream in order to carry on its business, added that:

> The further claim of the company that it had the right to make the deposits in the places complained of because it was necessary to the successful conduct of its own business to so place them, seems no less wanting in substance. The effect is to measure the rights of the plaintiff, in his lands, and in the waters of Monday creek, by the convenience or necessity of the company's business. An owner of land in Ohio is not subject to any such narrow and arbitrary rule.... [W]here the result of the acts of one on his own land is a direct and material injury to the property and property rights of another ... the maxim *sic utere tuo ut alienum non leadas* applies. (296)

In *City of Mansfield v. Balliett* (292), the plaintiff sued to recover damages for an alleged nuisance caused by the drainage of the defendant city's sewage into a stream which ran through plaintiff's land. The Ohio Supreme Court used quite broad language in upholding a verdict for the plaintiff:

> The pollution of water by discharging waste from mills and manufactories, or, indeed, in any way, creates an actionable nuisance, and the legislature has no power to authorize the pollution of the water of a stream without compensation to the owners of the land through which such stream flows, as such use is a taking of property within the meaning of the constitution. (297)

As late as 1915, in *Standard Hocking Coal Co. v. Koontz* (298), in which the plaintiff recovered a verdict for damages caused by the defendant coal company's discharges of sulphuric acid into the stream that ran through the plaintiff's land, it was reiterated that:

> We think it will be conceded as a fundamental and a well-established principle of law that an owner of land has the right to enjoy the soil itself, with the incidents thereto, in its natural state, unaffected by the tortious acts of a neighboring landowner, and where the land is located in such a way that a natural stream of water passes through it, the owner of the land, as a riparian owner, is entitled, as an incident to his estate, to the natural flow of the water of the stream in its accustomed channel, undiminished in quantity and unimpaired in quality. (299)

Yet, despite the tendency of the courts to speak in broad terms of "natural flow" while deciding cases such as the above for downstream landowners, such an absolute position was never really the law in Ohio. During the same decade, frequent cases began to develop a somewhat contradictory theory of "reasonable use." In *Salem Iron Co. v. Hyland* (300), the plaintiff sued to enjoin the operation of an oil well which pumped salt water into a stream that the plaintiff had been accustomed to using for the generation of steam. The court, emphasizing that the plaintiff sought only an injunction and no damages, held for the defendant. It mentioned that:

> The defendants are conducting a lawful business with care. They are conducting it at the only place where it can be conducted. Such injury as is done to the plaintiff is unavoidable. No injury to the health of the public or the employees of the plaintiff results. If the conduct of the defendants is without right, and a more appropriate rule of damages should not be suggested in an action at law, the recovery of a sum of money sufficient to pay the expense of obtaining water from another source would fully indemnify the plaintiff and relieve it of further injury without additional litigation. Cases which take no account of considerations such as these are not in harmony with the beneficient purposes for which the system of equity was established. (301)

Three years after the *Salem Iron* case, the Ohio Supreme Court decided *Straight v. Hover* (302), where plaintiff sued for an injunction and damages, alleging that the salt water discharged into a stream by the defendant's petroleum operation rendered the water unfit for her livestock and ruined her pastures. The court, after asserting that the lower proprietors of lands on a running stream have the right to receive the water from upper proprietors free from contamination by artificial means, established two principles: (1) that an action might be maintained for "substantial" injuries caused by invasion of the right; and (2) that "...in cases of this character where the invasion of the rights of the lower proprietor does not amount to an appropriation of his property, but merely constitutes a nuisance, an injunction will not be allowed to prevent the development of the resources of the lands of the upper owner, but that an action will lie for the recovery of such substantial damages as the lower proprietor may sustain by reason of such operations" (303).

Thus, while *Straight v. Hover* contained broad language concerning riparian rights of natural flow, it incorporated elements of a "reasonable use" approach by its insistence that substantial injury be a prerequisite to a suit, and by its development of the *Salem Iron* (300) approach that in cases involving conduct amounting to a nuisance, but not to an appropriation of property, damages would lie, but injunctive relief would not. Even more frank in abandoning the strict "natural flow" theory was *City of Mansfield v. Bristor* (304), where the Ohio Supreme Court approved the trial court's charge to the jury, which stated that:

> [T]he owner of land over which a stream of water flows has a right that it should continue to flow over his premises in the quantity, quality and manner in which it is accustomed to flow by nature, subject to the right of upper land owners, over whose land it also flows, to make a reasonable use of the stream, and that this right is a property right, and that the city would have a right to use

> this stream for sewerage purposes, providing it could do so without material injury to the lot owners below.... (305)

Further discussion of the older cases is not necessary in this report. Much of the contradictory language contained in the cases discussed above are merely *dicta* uttered in widely varying fact situations. If the decision was to be for the plaintiff, the courts tended to use broad "natural flow" language to define his rights; and if the decision was for the defendant, the "reasonable use" of defendant's land would be emphasized. Moreover, the fact that some actions, such as in *Salem Iron* (300), were merely for an injunction, while others, such as in *Balliett* (292), were solely for money damages, was generally a crucial factor in determining court's attitude. Furthermore, many cases, while seemingly adopting the natural flow theory, actually incorporated elements of reasonable use analysis by insisting that the plaintiff's injury must be material and substantial (306). However, it must also be remembered that, even as the Ohio courts fostered industrial development by developing theories of "substantial injury" and "reasonable use," they have never held in a case of severe pollution, such as raw sewage or sulphuric acid, that the defendant can avoid both an injunction and a damages suit on the theory that the pollution was necessary to the conduct of the business. The older cases worked out a rough form of justice whereby the industrial enterprise would not be stifled because of its pollution, but would be required, in essence, to "buy out" the injured parties.

Thus the basic legal situation is that the upper riparian landowner on the natural watercourse has the right to make some reasonable use of the watercourse. However, if such a landowner pollutes that watercourse, he will be liable for damages to the injured downstream riparian or, in an extreme case, susceptible to an injunction. Insofar as the addition of deleterious substances to the water are concerned, it is difficult to say what is "reasonable." The relatively recent decision of *Ratcliffe v. Indian Hill Acres, Inc.* (307) approved discharges of natural substances of mud and weeds where it was incidental to grading and excavating operations on defendant's land. Isolated cases, such as *Wheeler v. Fisher Oil Co.* (308), indicate that the discharge or even untreated industrial wastes may sometimes be reasonable. But the probability remains that most discharges of industrial wastes would not be deemed so "reasonable" as to exempt a defendant from liability for damages, at least where the plaintiff claims injury to his lands or personal discomfort, as opposed to a plaintiff who also wanted to use the waters for a business purpose (309). On the other hand, the Ohio cases indicate a favorable disposition toward trace pollutants caused by an otherwise reasonable use of land, with the discharge of such trace pollutants being definitely not enjoinable, and perhaps not even the cause of money damages.

Although the older Ohio cases, discussed above, dealt primarily with pollution of streams by addition of deleterious substances, there have been many cases in recent years that involve damages allegedly caused by the increase or decrease of the flow of a natural watercourse in the absence of pollution. These two types of cases must be distinguished in Ohio because of the simple difference between a stream clogged with acid or smelly wastes and a stream that merely flows faster or slower and with more or less volume. Since the latter is reasoned to be a less "harmful" change in the stream's nature, uses involving the latter results are even more likely to be found to be "reasonable" in Ohio than uses involving actual pollution.

The earliest such case is *Kemper v. Widows' Home* (310). The plaintiffs, who were residents of a home along "a deep ravine, which now is and always has been a natural watercourse," sought an injunction against the drainage of the wastewater of the defendant widows' home into the ravine. The court, after stating that the plaintiffs could not complain about any alleged pollution of the stream because they too deposited wastes in it, turned to the issue of increased flow in the stream and said:

> And plaintiffs claim that because the defendants, by means of the down-spouts from their building, and the drainpipes from their house, propose to throw this water into the street, and then permit it to go into this sewer or stream, their rights are invaded by the mere fact of that additional water being thrown into their course, and that it is an invasion of their right actionable because continuous, and enjoinable because the remedy at law is not adequate. The authorites which plaintiffs' counsel rely upon to sustain this position, all refer, however, to the flow of surface water from higher to lower land where there is no water course....
>
> Now, if that same principle applies to a water course, the plaintiffs' position is well taken. But I find that the authorities do not establish the same principle as applying to a water course. (311)

The court concluded that merely increasing the flow of water in a natural watercourse did not give a right of action, where the capacity of the stream was not exceeded and the increase of flow was due to the improvement of lots fairly within the territory drained by the watercourse. Similarly, another Ohio case has held that a *diversion* of waters from a stream, as for the creation of a mill race, can lead to liability if the lower riparian can show that he has suffered real, material, and substantial injury as a result of the diversion (312).

The question of remedy for either alleged diversion or pollution of a natural watercourse should be considered. In general, Ohio has strict standards of proof that must be met before a recovery is allowed, which militate against successful prosecution of trivial claims. First, it should be noted that discharges merely increasing the flow of a natural watercourse, without affecting its quality, are not enjoinable in Ohio. In *Aubele v. A. B. Galetovich, Inc.*, (313), village residents sued to enjoin the village and certain developers from casting surface waters and septic tank effluent into a stream which flowed through their land. The trial court denied the injunction, and the Ohio Court of Appeals affirmed, dismissing the petition and saying that where it appeared that the water discharged emitted no odor, and contained no foreign matter or bacteria in amounts greater than in similar streams, and where the plaintiffs' only real complaint was of increased flow in the waterway, they would not be entitled to an injunction.

On the other hand, it has been held that the discharge of raw sewage into a natural watercourse could be enjoined (314). But in *Spicer v. White Brothers Builders, Inc.* (315), in which lower landowners sued to enjoin the defendants from draining water and septic effluent across their lands, it was held the drainage could not be enjoined in the absence of a showing of substantial injury constituting an appropriation of property. Other cases indicate that even pollution which amounts to a legal nuisance will not be enjoined, but will give rise to only an action for damages, unless the pollution is so extreme as to amount to an appropriation of property (316). It is further held that in any case in which the plaintiff seeks an injunction, the right to an injunction must be clear and the proof convincing, injury must be actual and palpable, and regard must be given to the injuries which might result to others from granting the injunction (317).

If, on the other hand, a plaintiff sues for money damages rather than for injunctive relief, it is said that the plaintiff's damages must be "real, material, and substantial" before his action will lie (318). Once the threshold issue of materiality has been met, the question becomes one of what principle will be applied to determine the amount of damages recoverable by the plaintiff. In a case involving pollution of a stream by a mining company, it was held that the proper measure of damages to a riparian owner is the difference in the value of the land before and after injury occurred, and not the depreciated rental value from the date of the occurrence of the injury (319). And in *Standard Hocking Coal Co. v. Koontz* (298), where the defendant pumped sulphuric acid from its coal mine into a stream running through the plaintiff's land, the court stated that:

> We further think that it is a sound principle of law that in an action for damages to real property testimony is admissible to show the exact character of the injury suffered, whether of a permanent or irreparable nature, or of the sort susceptible of repair, so that the property may be restored to its original condition. If the testimony shows the former to be the nature of the injury, the measure of damages is the difference in value of the property before and after the injury. If an injury susceptible of repair has been done, the measure of damages is the reasonable cost of restoration plus the reasonable compensation for any loss of the use of the property between the time of injury and restoration, unless such cost of restoration exceeds the difference in the value of the property before and after the injury, in which case the difference in value becomes the law. (320)

With the *Koontz* case providing the best general statement applicable to damage principles, several other relevant principles are worth mentioning. Among the damages a plaintiff can collect for cases based on pollution of a natural watercourse are damages for the decrease in comfort and enjoyment of the premises for the plaintiff and his family (321) and damages for "annoyance and inconvenience" caused by the pollution (322). Moreover, if "malice" can be shown, punitive damages may be collectible.

Implications for Land Application Systems--

With regard to possible interference by a land application system with the flow of a natural watercourse, the Ohio law concerned with natural watercourses has generally favorable implications. Any of the possible methods of application would meet the Ohio definition of "irrigation," and it has been held that irrigation is a reasonable--and therefore permissible--use of the waters of a natural watercourse. A lawsuit resulting from the diversion of wastewaters from a watercourse is unlikely to occur; however, if it did occur, the operators of the application system may be held liable for the damages proven by the downstream landowners, and might even, in an extreme case, be enjoined from further operation of the system. However, the possibility of an injunction being issued against a use legally characterized as "reasonable" is quite small, particularly in Ohio, which has shown more willingness to shield even consumptive uses of water from liability than the typical riparian state.

The second way in which the law of natural watercourses in riparian states intersects with land application systems is when, after application, trace contaminants remain on the land and are eventually washed into a natural watercourse. Such a result will not always occur, but if, in a particular situation, some contaminants drain into a natural watercourse, then the following consequences may ensue. It is clear that there can be liability in Ohio for the pollution of the waters of a natural watercourse. This can occur even with a use that is "reasonable;" it being recognized that even reasonable uses may harm other interests and should compensate those harmed as part of the cost of operation. Although in theory, the relief an injured downstream landowner may receive could include either money damages or an injunction, the likelihood of either type of relief being awarded is extremely remote. If the system is being carefully operated, it is most unlikely that the entire application system would be enjoined from further operation. Since Ohio applies the "balancing of the equities" doctrine, its courts will consider, in any action for an injunction, all the facts relating to the reasonableness and usefulness of the land application system.

If a claimant sought money damages instead of an injunction, such relief, in theory, would be easier to obtain. The possibility, however, is limited by several factors. First, the right to sue for harm to a watercourse is limited to persons owning an interest in land adjoining the watercourse. Second, the landowner who brings a suit must prove actual and substantial harm to the watercourse and that the harm affects the market value of his land. In the case of mere trace pollutants, such a showing will usually be difficult, if not impossible, to make. Third, any possible recovery of damages will be limited to the proven decline in the land's market value, which in a rural area will not often be a large amount. And, finally, in Ohio (unlike many other riparian states), there are some cases indicating that proof of the reasonableness of the defendant's conduct may wholly defeat an action for money damages as well as an action for injunctive relief.

There is no way the system's operators can totally eliminate the possibility of liability for trace pollution or interference with flow of a natural watercourse (323), but the steps set forth in the section of Volume I of this report concerned with natural watercourses for riparian states and those for Arkansas further minimize the possible risk.

## Law of Surface Waters

### Description--

As is true in most other riparian jurisdictions, the bulk of Ohio's surface water law deals with the question of landowners--either upper or lower--trying to rid themselves of unwanted surface waters. In this context, Ohio distinguishes between "rural" and "urban" rules, and applies the civil law rule in rural areas, and the common enemy rule in urban areas.

In a rural area, the lower landowner is under a duty to receive the natural drainage of surface water from higher lands, but in an urban setting, he is not so obligated and may take steps to stop the drainage onto his property. Thus, in *Keiser v. Mann* (324), the lower landowner in an urban area filled in his land, causing surface waters to remain on what had been upper lands, and a directed verdict for the defendant lower landowner was sustained. Conversely, the law is relatively clear that in a rural area the upper landowner may not discharge anything other than surface water onto the lower lands, and, indeed, may not significantly change the natural runoff of the surface waters. For example, in *McKiernann v. Grimm* (325), it was held that lower land owes a servitude to upper land to receive the water which naturally runs from it, provided the industry of man has not been used to create the servitude. *Dill v. Oglesbee* (326) held that an upper rural landowner could install a drain to drain surface waters over lower lands that would have passed over the lower lands anyway.

However, it was held in *Butler v. Peck* (327) that an upper landowner could not, by means of an artificial drain, cast waters on lower lands where there was no natural outlet for such waters and where such waters would not have passed over the lower lands but for the artificial drain. Finally, in *Johnston v. Miller* (328), it was held that a rural landowner could not increase the burden on lower lands by collecting surface water and discharging it at points other than those established by natural drainage.

The upper landowner in an urban situation is allowed more leeway in improving his drainage. *Strohm v. Molter* (329) held that the action of the defendant, who created a terrace which caused water on the rear of his lot to drain onto the plaintiff's land in a slightly different location, was not an unreasonable use of his land in urban surroundings. On the other hand, even the rural upper landowner may collect, by sewers or other artificial means of drainage, the surface waters gathering on his property, and channel it into a natural watercourse, thereby increasing the volume and accelerating the flow of the watercourse, without incurring liability to downstream landowners (330). It has been held that such drainage is not actionable even though the channel into which drainage has occurred is inadequate to accommodate the increased flow (331), although the drainage will subject the upper landowner to liability if he discharges his surface waters at points other than those established by natural drainage (332). However, the point has also been made that this rule applies only to drainage of surface water, and not to additional waters pumped from wells and used by an upper landowner for business purposes (333).

When we turn from drainage of naturally occurring surface waters to drainage of trace pollutants into surface waters, the Ohio authorities become much more sparse. There are very few Ohio cases involving pollution of surface waters. This may be because of the difficulty of proving injury. Treated effluent that runs across the surface of someone's land and sinks into the soil with precipitation should leave little or no sign of pollution. Damage, if any, will usually be psychological or aesthetic. In one case involving surface water pollution--an urban situation--the court refused to grant an injunction to prevent the drainage of effluent from subdivision septic tanks (334). The court stated that damages or substantial injury amounting to a taking of the plaintiff's property must exist to allow the granting of an injunction. The court relied on cases involving pollution of watercourses as precedent, thus implying that the same standard of care is involved in both kinds of pollution. Thus, in an urban area, trace pollutants passing across lands by means of surface waters may be treated the same as trace pollutants finding their way into natural watercourses.

A stricter rule may be applied in rural areas. Several of the cases holding that the rural upper landowner has the right to have his surface waters naturally drained across lower lands emphasize that this right is limited to naturally occurring surface waters, and does not extend to "deleterious substances" added by the landowner. It is possible that, while the rural rule is more favorable to the upper landowner in the context of natural drainage, it could be less favorable to the upper landowner in the context of trace pollutants. If Ohio were to hew literally to the civil law rule in rural areas and applied those rules to instances of trace pollution of surface waters, it would follow that such pollution would be enjoinable without regard to the reasonableness of defendant's use of its land. While there is no holding to this effect in Ohio, the possibility of such a result is slightly more likely than in other riparian states because of the fairly strict civil law rule applied in rural areas and the language in several older cases indicating that the upper landowner's natural servitude is limited to naturally occurring surface waters, such as rain or snow. Whether the strict Ohio requirements of proof of harm, applicable to a natural watercourse action, would apply in a lawsuit involving trace pollution of surface waters remains to be determined.

If the land application system operators did not want to take the risk of liability for contamination of surface waters, they could arrange to retain all the surface water, including ordinary precipitation, within the boundaries of the project. The question then arises whether retaining precipitation which previously had flowed across adjoining lands would give rise to liability (335). The general rule is that the owner of the soil can retain and use all the precipitation received without any liability to other landowners (336). Nothing in Ohio law suggests a departure from this rule, and indeed the strictness of Ohio's rural civil law rule suggests that this rule of absolute ownership would be applied, at least in rural areas.

Implications for Land Application Systems--

As noted, land application systems may affect surface waters either by producing trace contaminants which may drain from the site with diffused surface waters, or by retaining both the trace pollutants and surface waters, such as rainfall, at the application site. The Ohio law has implications for land application systems in both of these situations. Although the law is not unfavorable in either situation, the implications are more favorable in the second situation, when both pollutants and diffused surface waters are retained at the application site, than in the first situation, when both are dispersed to adjoining lands.

In the first instance, trace pollution of surface waters crossing the lands of another person, Ohio, like many riparian states, has no law directly on point. The problem with Ohio's jurisprudence lies in the fact that Ohio still applies a strict civil law rule to rural lands. If the civil law view of preserving the natural state of affairs were applied literally in the pollution context, it would mean that every instance of trace pollution would be enjoinable, as an interference with the natural flow. No riparian state, however, has ever been that strict. Even those states which adhere to a relatively pure civil law rule for issues involving dispersal of surface waters indicate that pollution of those waters is governed by the analysis applicable to pollution of natural watercourses. This will usually be a rule of reasonable use, even in states classified as civil law jurisdictions for other purposes. That is, pollution for no valid purpose might be unlawful, but pollution in connection with an otherwise reasonable use might be lawful. The problem in Ohio lies in the fact that there are no cases yet making this distinction between questions of increased drainage and questions of trace pollution. Therefore, the Ohio law is necessarily uncertain on this point.

On the other hand, if the system collects both surface waters and trace pollutants on its property, there is no possibility of liability for interference with the flow of surface waters. It is clear that, as the lower landowner has no "property" right to the surface waters, he cannot insist on their continued flow. The upper landowner can with impunity collect all surface waters on its property. Given these basic principles, the recommendations for Arkansas and those contained in Volume I of this report for land application systems as they relate to surface waters in riparian states, should be followed in Ohio.

## Law of Groundwater

Description--

Groundwater in Ohio, as in other riparian states, can be divided into two categories: (1) percolating water, which oozes and filters from the lands of one owner to the lands of another; and (2) subterranean streams, which flow in a permanent, distinct and well-defined channel (337). Subterranean streams are governed by the same rules of law that govern watercourses flowing upon the surface of the earth (338), whereas percolating waters are appurtenant to realty (339).

With regard to questions of use of percolating waters, Ohio follows the absolute ownership rule, that is, a landowner may use all the water beneath his land without regard to injury to adjoining neighbors. The only possible liability found in the Ohio cases is if a use of land raises the water table above the surface of neighboring land, an action in trespass would exist (340). Otherwise, there appears to be no liability in Ohio for use of groundwaters, or for raising of the groundwater table by use of land, at least in the absence of malice. There are Ohio cases indicating that there will be no liability if an otherwise reasonable use is carried on negligently and thus cuts off a neighbor's percolating water (341).

In cases involving pollution of percolating waters, however, the rule in Ohio seems to be that a landowner is liable if he contaminates the waters percolating through his land to the injury of a neighboring landowner whose well or spring subsequently receives the percolating waters so contaminated. In *Bassett v. Osborn* (342), the plaintiffs' land included a spring of water which they used for domestic purposes. The defendant, who was a neighbor, built a cesspool into which he deposited refuse from his house. This cesspool was located about 325 feet from the plaintiffs' spring, and evidence indicated that the cesspool's contents leaked through the earth and rendered the spring's waters unfit for domestic purposes, such as drinking or culinary use. The court emphasized that there was no negligence by the defendant: "It is not claimed and surely is not shown that the defendant has constructed this pool carelessly. On the contrary, he took pains to have it done to the satisfaction of the acting health officer ... and ... seems to have done all that could be done to prevent injury to the plaintiffs..." (343). Despite this finding, the court granted the plaintiffs the injunction they requested.

An argument was made by the defendant in *Bassett* that the rule of no liability, applicable in Ohio to a case involving *diversion* of percolating waters, should also be applied to a case involving *pollution* of percolating waters. The court, however, distinguished the two situations when it stated:

> In the one case, the lower proprietor is wholly deprived of the water which would by nature have percolated through the lands of the defendant and into the lands of the plaintiff. In the other the water is not prevented from going upon the plaintiff's land, but is allowed to go in a state wholly unfit for use, and, in fact, prejudicial to health if thus used. (344)

Although the court never did explain why one type of deprivation of the use of percolating water should result in liability when another type of deprivation did not, it held that the plaintiffs were entitled to an injunction perpetually restraining the defendant from permitting any of the contents of his cesspool to percolate upon the plaintiffs' premises. Liability was apparently based on the doctrine of nuisance, which is a form of strict liability. The court did not specifically so state, but each of the cases it cited with approval from other jurisdictions based liability on nuisance, and the court's explicit finding that the defendant was not negligent negated any other conclusion.

This might appear to be a very stringent rule on the surface; however, it must be remembered that, in order to prove a nuisance, a plaintiff must prove substantial harm depriving him of use and enjoyment of his land. Basically, cases of minor harm caused by trace pollutants will not often fall within this rule.

### Implications for Land Application Systems--

With regard to the possibility of trace contaminants reaching groundwater supplies, Ohio law has reasonably favorable implications for establishment of land application systems, although there may be more uncertainty than in other riparian states. Ohio applies, in essence, the absolute ownership rule to groundwaters. In most of the states which apply some version of the absolute ownership rule, liability for pollution is less likely than under the reasonable use rule; usually there is no cause of action for pollution in the absence of malice or negligence. In a few states there is no liability even if negligence is proven. This is apparently true in Ohio in situations involving diversion of percolating water. At the other extreme, there are a few states in which liability for pollution is imposed even in the absence of any negligence or other fault by the polluter. Ohio may fall into this category, since the few cases imposing liability for pollution of percolating water supplies do so without any mention of limiting factors such as negligence or malice. As was previously discussed, in one case liability was found even in the absence of negligence of any sort. The possible magnitude of such liability, however, is minimized by two factors: (1) the requirement of proof of substantial harm; and (2) the fact that the Ohio cases speak in terms of nuisance, which is at least narrower than "strict liability," since a nuisance occurs only when there is a substantial interference with one's use and enjoyment of land. The sort of trace pollution that may typically be caused by land application systems is unlikely to give rise to fact situations justifying liability under Ohio law.

If a lawsuit alleged harm because a land application system, in the absence of polltuion, raised the water level of the groundwater, the complaining landowner will have a much more difficult time in attempting to collect damages from the system's operators. If there is no provable negligence in the operation of the system, and no intentional harm being done, there are no cases allowing any recovery by such a landowner, even though Ohio may apply a version of the strict liability rule to cases involving pollution. As noted, there are even cases in Ohio indicating no liability for diversion of percolating water even if an otherwise reasonable use is carried on negligently. This rule might logically apply to nonpolluting additions to percolating waters as well, which creates an anomalous situation in that Ohio would have one of the more strict rules for cases of pollution of percolating waters, but the least strict rule in the country for raising of the water table.

This anomaly may simply be explained by conflicting language in the few Ohio decisions on point. The fact remains, however, that the possibility of liability in Ohio for interference with percolating waters is very small. In addition, the precautionary steps outlined for Arkansas and in Volume I of this report for groundwater in riparian states can be taken to minimize the possibility of liability.

### Summary

Ohio has an extensive--and fairly recent--statutory structure regarding water pollution. First of all, the Ohio Environmental Protection Agency (OEPA) is given broad powers to control, prevent and abate pollution of the waters of the state (345). Waters of the state are defined to include "...all streams, lakes, ponds, marshes, watercourses, waterways, wells, springs, irrigation systems, drainage systems, and all other bodies or accumulations of water, surface and underground, natural or artificial..." (346). Clearly a particular land application project could fall within the jurisdiction of this agency. The Ohio Water Pollution Control Act (347), which OEPA enforces, declares the pollution of any waters of the state to be a public nuisance unless the director of environmental protection issues a permit to the alleged polluter (348). This provision does not apply, however, to the application of any materials to land for agricultural purposes or to runoff of such materials from such application (349). It is fairly certain that a land application project would be covered by this exception. If a permit were required, however, then it is clear that pollution without a "valid and unexpired" permit constitutes a public nuisance (348), and that all private rights of action and remedies in equity or under the common law are preserved to affected private parties (350).

Favorable possibilities exist in Ohio for land application systems. Ohio's underlying water law is one of the most favorable in the nation. The state's Water Pollution Control Act (347), by specifically exempting applications of materials to land for irrigational purposes, indicates a willingness to foster development of such systems.

## PENNSYLVANIA

Pennsylvania does not have regulations specifically devoted to land application systems. However, the Pennsylvania Clean Streams Law (351) declares discharges of pollutants into waters of the Commonwealth to be unreasonable and unnatural uses of such waters, therefore, to be against public policy and to be a public nuisance (352). Discharges which will not pollute, such as sewerage systems, must receive a permit from the Department of Environmental Resources before construction (353). The application for a permit for each proposed wastewater disposal facility is reviewed by the department's technical staff and a decision made on a case-by-case basis. In this regard, the burden of providing sufficient information necessary to evaluate a particular system and site is placed on the applicant.

The Department of Environmental Resources has developed the "Spray Irrigation Manual" (354) as a guideline to potential wastewater irrigation applicants. Spray irrigation installations can be utilized according to the "Manual" where the wastewater contains pollutants of such type and concentration that they can be successfully treated through distribution to the soil mantle. Generally, the equivalent of secondary treatment must precede spray irrigation. However, because of the variability of earth materials, spray field use, and effluent constituents, treatment requirements and performance criteria have to be determined on a site-by-site basis. The prime consideration for site selection is the ability of the organic and earth materials to properly treat the wastes (355). Guidelines relating to soils, geology, hydrology, weather, agricultural practices, adjacent land uses, pretreatment, wastewater storage, screening, piping, sprinkler types and spacing, and application rates are specified in the "Manual."

Once the requirements of the Clean Streams Law (351) are complied with, the underlying law of water rights in Pennsylvania should not present too much difficulty to the system operators.

### Law of Natural Watercourses

Pennsylvania is a reasonable use riparian jurisdiction (356). In addition, Pennsylvania jurisprudence contains some of the broadest statements legitimizing commercial uses of water, even when those uses cause specifically provable harm to down stream riparians (357). Since land application would be viewed as irrigation, therefore, an approved use, it is virtually certain that no court would issue an injunction against a well run land application system in the absence of negligence or malice. While money damages might be a possible remedy in a case where a downstream riparian could prove harm caused by trace pollutants from an upstream land application system, even here Pennsylvania's law is more favorable toward developers of water resources than that of other states (358).

### Law of Surface Waters

Pennsylvania follows the common enemy rule as to urban properties (359), although it has been modified to permit liability for causing unnecessary damage through negligence. In rural areas, in which land application systems are more likely to operate, the civil law rule is applied (360). While this rule is relatively restrictive, in that it prohibits the upper landowner from draining anything but natural drainage across the lower lands, Pennsylvania has qualified it by ruling that changes in the quality or quantity of the flow of surface water will be permissible where occurring as part of a proper and profitable use of the upper land, if the change in question is not unreasonable in relation to the use. In addition, since trace contaminants mingled with surface waters can be retained at the application site with impunity under Pennsylvania law, it is clear that the underlying water law of the state, in its entirety, is highly favorable to the development of land application systems.

### Law of Groundwater

Pennsylvania follows the absolute ownership rule in cases involving obstruction or diversion of groundwaters (361). In *Wheatley v. Baugh* (362), it was reasoned that:

> But percolations spread in every direction through the earth, and it is impossible to avoid disturbing them without relinquishing the necessary enjoyment of the land. Accordingly the law has never gone so far as to recognize in one man a right to convert another's farm to his own use, for the purposes of a filter. (363)

The waters beneath the surface were simply part of the owner's interest in his land, and if in using them he drained off waters so as to inconvenience his neighbor, it was not the basis of any cause of action.

Whatever the difficulties which the absolute ownership rule poses for preservation of groundwater supplies, the fact remains that it is the most favorable rule of law for a person such as the operator of a land application system who will be engaging in an innovative use of land that might have an impact on a groundwater supply. While Pennsylvania has modified the rule to the extent of holding that there can be liability for negligent (that is, unnecessary) or malicious obstruction of groundwater supplies (364), the basic absolute ownership rule remains the law of Pennsylvania.

In the case of *pollution* rather than obstruction of groundwaters, Pennsylvania also applies a modified absolute ownership rule; that is, there is no liability for pollution of groundwater in the absence of negligence or malice (365). This is in contrast to many other states which apply the absolute ownership rule to cases of obstruction or diversion, but shift to reasonable use analysis for questions of pollution. In addition, Pennsylvania cases emphasize the necessity of proving a causal relation between the asserted pollution and the harm, which further diminishes the possibility of recovery of damages (366).

## TENNESSEE

The Tennessee Department of Public Health has prepared administrative guidelines directly applying to land application of wastewaters (367), while the state's Water Quality Control Board has adopted regulations that indirectly apply (368). In addition, the Tennessee Water Quality Control Act of 1971 (369) also has recently been applied to private land application projects.

## Water Quality Control Act of 1971

The Water Quality Control Act of 1971 has been described as one of the most significant pieces of environmental legislation in recent years (370). All waters of the state are held in public trust for the use of all Tennesseans under the Act (371).

Certain responsibilities are granted under the Act to the commissioner of the Tennessee Department of Public Health, who also serves as the chairman of the Tennessee Water Quality Control Board (372). The commissioner administers all laws relating to pollution of the state's waters (373). The board is authorized to adopt standards of quality for all waters of the state and to hear appeals from orders or permits issued by the commissioner (374).

Several types of conduct are prohibited by the Water Quality Control Act of 1971. First, it bans pollution of the waters of the state unless the pollution is due to an act of God, an unavoidable accident, or an activity which has been properly authorized (375). Second, the Act prohibits the violation of any rule, regulation, or standard of water quality promulgated by the board (376). Third, failure or refusal to file an application for a permit is a violation of the Act (377). Fourth, the Act prohibits the refusal to furnish or the falsification of any records, information, plans, specifications, or other data required by the board (378). Fifth, the Act bans the violation of any permit or order issued by the board (379).

Unless a person holds a valid permit it is unlawful for him to: (1) alter the physical, chemical, radiological, biological, or bacteriological properties of any waters of the state; (2) construct or operate a water treatment plant; (3) increase in volume or strength any wastes in excess of the standards permitted under an existing permit; (4) construct or operate an establishment which is likely to alter the properties of any waters of the state; or (5) construct or operate any new outlet for the discharge of wastes in the waters of the state (380).

The Act grants power to the commissioner to make decisions and to enforce them. The commissioner issues or refuses to issue permits (377). Whenever the commissioner has reason to believe that a person has violated the Act, he may issue a complaint. In addition to the complaint, the commissioner may issue an order to take corrective action (381). The commissioner may institute proceedings in an appropriate court for injunctive relief upon belief that a person is violating the Act (382). He may also bring suit in an appropriate court for enforcement of his orders (383). The commissioner may assess a person who violates the Act for damages to the state (384).

The penalties for a person who violates the Act may depend upon his state of mind at the time of the offense. Any person who fails, neglects, or refuses to comply with the Act is guilty of a misdemeanor. Upon conviction he pays a fine of not less than fifty dollars or more than five thousand dollars. Each day upon which a violation occurs is a separate offense. Any person who willfully and knowingly violates the Act is guilty of a felony. The court may fine him not more than ten thousand dollars, imprison him for not more than two years, or do both. Political subdivisions and their officers and municipalities and their officers are not subject to criminal prosecution (385).

The Act specifically provides that it shall not be construed as altering the rights or remedies under existing law (386).

Although the Tennessee Water Quality Control Act of 1971 does not mention the phrase "land application of waste water," its provisions clearly apply to this process. Indeed, the Water Quality Control Board has already approved plans for the construction of land treatment sites submitted by two industries in the state--H.I.S. Apparel at Bruceton and Tennessee Eastman at Kingsport (387). The Act provides that a person must obtain a permit if he alters the properties of any waters of the state, operates a waste treatment plant, operates a project which is likely to alter the properties of any waters of the state, or operates any new outlet for the discharge of wastes in any waters of the state (380). A proposed land application system may fall within all those categories and certainly falls within some of them. Because the proposed system is within coverage of the Act, the builder is required under administrative regulations to submit construction plans (388), permit an on-site investigation (389), and monitor discharges (390).

The State Department of Public Health would require the builder of the proposed land application system to establish a series of wells near the system. The number and size of the wells would depend upon the size of the system and the hydrology of the area. The builder would be required to take samples of the water from the wells for testing (387).

The Act authorizes the Water Quality Control Board to classify all waters of the state and to establish quality standards for those classifications (391). The builder of the proposed land application system would have to satisify the standards set by the board for his area. If the builder violated the standards, he would be subject to the penalties.

### Law of Natural Watercourses

Description--

The courts in Tennessee have adopted the reasonable use version of the riparian rule. The following statement in *American Association, Inc. v. Eastern Kentucky Land Co.* (392) illustrates the compromise implicit in this rule:

> The sound rule, we take it, to be extracted from the best considered cases is that each riparian owner has an equal right to have the stream flow through his land in its natural channel, without material diminution in quantity or alteration in quality but with this limitation or qualification, however, that each

> proprietor is entitled to the reasonable use of the water for domestic, agricultural or manufacturing purposes. (393)

In *Hurley v. American Enka Corp.* (394), the validity of the reasonable use rule was reaffirmed. The court states: "Plaintiff and defendant are both riparian owners. As such, each has a right to make reasonable use of the stream" (395). In *Tallassee Power Co. v. Clark* (396), a Federal appellate court explained the rule in this manner:

> As we understand the law laid down in many cases, the right of each riparian owner qualifies that of the other, and the question always is not merely whether the lower proprietor suffers damage, but whether under all of the circumstances of the case the use of the water by one is reasonable and consistent with its enjoyment by the other. The test is always imposed with regard to the equality of right between the several riparian owners. If the injury to one is merely incidental to the reasonable enjoyment of the common right by the other, there can be no redress. (397)

A riparian owner may not materially reduce the level of a stream or lake. In *Webster v. Harris* (398), the court enjoined the defendant from draining part of Reelfoot Lake. The court commented that the level of the lake could not be changed wrongfully and unnecessarily. In *Cox v. Howell* (399), the defendant diverted water from a stream for use in a steam generating plant. The reduction in the volume of water in the stream prevented the plaintiff from operating his mill. In enjoining the defendant from diverting the water, the Tennessee Supreme Court stated:

> [E]very riparian owner has a right to use primarily the water of a flowing stream for domestic purposes, for the support of life in man and beast, and, in addition, in a proper and reasonable way, for the irrigation of his land, or for the operation of his machinery on his land, provided the volume of water in the stream warrants this use above domestic uses. (400)

Moreover, the court asserted that the reasonableness of a particular use is dependent upon both the character of the stream and the purpose for which the water is used.

The courts have held that a riparian owner is entitled to receive floodwaters without obstruction by another riparian owner. In *Tallassee Power Co. v. Clark* (396), the defendant electric company operated a dam above the plaintiff's property preventing floodwaters from reaching it. The electric company contended that the waters were destructive; therefore, it argued that the plaintiff could not acquire rights in the floodwater. The Federal appellate court disagreed and stated: "The right to have floodwaters overflow the riparian land has been recognized by many courts" (397). Because the floodwaters bestowed the benefit of silt and sediment, the obstruction of the floodwaters was illegal.

The courts in Tennessee also prohibit the casting of large amounts of water upon the lands of other riparian owners. This may occur either when an upper riparian owner releases impounded water or when a lower riparian owner obstructs the flow of water upon his land. A riparian owner may construct a dam across a stream if it does not adversely affect other riparian owners (401). However, a riparian owner is liable for flooding caused by his dam (402). In *Tennessee Electric Power Co. v. Robinson* (403), the defendant released a huge volume of water into a stream by opening the floodgates of a dam. Although the appellate court returned the case to the trial court for a determination of fact, it asserted that "...one who constructs and maintains a dam has no right to discharge the contents of the pond thereby made so as to increase the flow of the water course beyond its natural capacity, to the injury of the lower riparian proprietor" (404).

Although a substantial interference with the flow of a watercourse is illegal, the court may award damages but deny an injunction, particularly if it attempts to "balance the conveniences." In *Hurley v. American Enka Corp.* (394), a manufacturer built a dam downstream from the property of the plaintiff. The impoundment of water caused flooding on the plaintiff's property. After finding that the conduct of the manufacturer was unreasonable, the Federal trial court awarded damages for the destruction of crops and the diminution of the value of the farm. However, the court refused to grant an injunction. According to the court, the denial of injunctive relief was appropriate in view of the value of manufacturing to the community.

The Tennessee Supreme Court expressed a similar view in *Madison v. Ducktown Sulphur, Copper & Iron Company* (405). Damages were awarded to the injured plaintiff, but the court refused to grant an injunction. The court balanced the conveniences by comparing the value of the activity conducted by the defendant to the value of the activity conducted by the plaintiff. The court stated:

> But in a case of conflicting rights, where neither party can enjoy his own without in some measure restricting the liberty of the other in the use of property, the law must make the best arrangement it can between the contending parties, with a view to preserving to each one the largest measure of liberty under the circumstances. (406)

In addition to the safeguards offered by statutes, the common law of Tennessee protects riparian owners from unreasonable pollution. In *Sumner v. O'Dell* (407), the defendant confined his cattle to a small area surrounding a stream. These cattle fouled the stream, which crossed land owned by the plaintiff. The court asserted: "Whether or not the pollution of the waters of a stream is an actual injury to a lower riparian proprietor depends upon whether it is the result of such reasonable use of the stream as the upper owner is entitled to make, or an unreasonable use in excess of his rights" (408). In holding that allowing the cattle to drink from the stream was reasonable, but confining them to a small area surrounding the stream was unreasonable, the court granted the injunction.

The court espoused a similar view in *H. B. Bowling Coal Co. v. Ruffner* (409). In this case the defendant operated a coal mine and pumped water from the mine into the stream which adjoined the property owned by the plaintiff. This water, which contained acid, rendered the water in the stream unfit for use by humans, animals, and machines. The court found that the water from the mine could not be purified. Disposal of the water was necessary for the operation of the mine. In spite of these factors the defendant was liable for damages. The court disallowed the defense that the pollution was a necessary result of the mining operations.

Implications for Land Application Systems--

Two possible problem areas existed for a proposed land application system under the Tennessee cases which deal with natural watercourses. First, the proposed project would improve the quality, but diminish the quantity of water flowing in a natural watercourse. Riparian owners in Tennessee are entitled to the reasonable use of water from a natural watercourse for various purposes. The operation of the proposed system may not qualify as the diversion of water from a watercourse. Relevant cases in Tennessee deal with persons who have appropriated water which is part of the watercourse. Even if the operation of the proposed project qualifies as the diversion of water from a watercourse under the previous cases, it is entitled to the reasonableness test. The decrease in the amount of water in the watercourse due to the operation of the proposed project may be small. Another measure of the reasonableness of the diversion of water is the purpose for which the water is used. Because the purpose of the proposed project is to clean up the environment, it is probable that a court would find the diversion of water by the proposed system to be a reasonable use.

Support for the contention that a lower riparian owner is entitled to the full flow of the watercourse may be found in *Tallassee Power Co. v. Clark* (396). The court held that a lower riparian owner was entitled to the "natural" flow of floodwaters because they bestowed the benefit of silt and sediment. In the instant case a riparian owner might argue that he is entitled to the "natural" flow of polluted waters because they provide the volume of water necessary for certain activities.

Second, drainage from the proposed project might pollute a watercourse. Tennessee law protects riparian owners from unreasonable pollution. In assessing the reasonableness of the use of the water by the proposed system, the court would consider the character of the watercourse and the value of the activities. Because the rights of the riparian owners are correlative, the reasonableness of the use of the water by the proposed system would depend in large measure upon the particular situation.

## Law of Surface Waters

Description--

The courts in Tennessee have adopted the natural flow or civil law theory, under which rule the owner of an upper tract of land has an easement in the lower tract for the drainage of naturally occurring surface waters. Moreover, they have specifically rejected the common enemy doctrine (410) and the combination urban-rural rule (411).

Tennessee courts have held that the upper landowner and the lower landowner share mutual obligations. In *Davis v. Louisville & Nashville Railroad Co.* (412), the court states: "It is a well-established rule of law in this State that lands lying at a lower level are burdened with the servitude of receiving all waters which naturally flow down to them from lands adjoining and upon a higher level" (413). The lower landowner is liable for the damage caused by blocking the natural flow (414). On the other hand, the upper landowner is liable for damages if he alters the natural condition of his property and collects the surface and rain water together at the bottom of his estate and pours it in a concentrated form or in unnatural quantities upon the land below (415).

Incidental changes in the natural flow of surface waters are permissible according to Tennessee courts; however, a modificiation which causes damage is illegal. In *Dixon v. City of Nashville* (416), the court held that the city was responsible for damages caused by interference with the natural drainage of surface water by the construction of a street. The court stated that the city may improve its property in any ordinary way as long as there is no substantial change in the flow of surface waters. Although the city was not liable for the extra runoff caused by the paving of the street, it was liable for the deflection and concentration of water into a drain.

An upper landowner may protect his agricultural land by digging ditches along the natural depression or drainway (417), but he may not damage lower lands by discharging surface waters with increased force or volume (418). In *Tyrus v. Kansas City, Fort Scott & Memphis Railroad Co.* (419), the railroad constructed a culvert which received the drainage from 58 acres of land. The release of water from the culvert caused a large gully on a lot owned by the plaintiff. The court found the railroad liable for sending the surface waters upon the land with greater volume and with greater force than it was accustomed to flowing.

A lower landowner does not have an obligation to receive the unnatural flow of surface waters. In *Mayor of Sweetwater v. Pate* (420), the city built ditches which emptied water from several streets onto property owned by the defendant. The defendant obstructed the ditches to prevent the water from damaging his property. The court refused to enjoin the defendant from maintaining the obstruction. It held that the defendant had a right to protect his property from the unnatural flow of surface waters. In *Slatten v. Mitchell* (417), the defendant erected a dam to prevent surface waters from flowing onto his property. The court refused to grant an injunction against the defendant for maintaining the dam. Although the court acknowledged the duty of the defendant to preserve the natural flow of surface water, it held that the flow of surface water in this case had been increased by neighboring landowners. The court asserted that the defendant was entitled to "...protect his lands from the injurious effects of surface water, if, in thus relieving himself, he respects the rights of others" (421). The defendant acted reasonably in refusing to receive the destructive waters.

Implications for Land Application Systems--

Although the courts in Tennessee have not established rules in two significant areas of surface water law, it is likely that they will follow the rules established by the courts in a majority of jurisdictions. The majority views in both areas are consistent with the existing framework of Tennessee law. The courts in most jurisdictions which apply the natural flow test to determine liability for the use of surface waters apply a reasonable test to determine liability for the pollution of surface waters. Therefore, the courts in Tennessee probably will adopt a reasonableness test in cases involving the pollution of surface waters. Most courts hold that the owner of land has the right to appropriate all surface waters which are found on his land. Property rights do not attach to the flow of surface waters until they arrive at a natural watercourse (336).

The Tennessee cases dealing with surface waters may pose two problems for the builder of a system for the land application of wastewater. First, the surface waters which flow from the site of the proposed project may contain contaminants. The courts in Tennessee have not decided any cases dealing with the pollution of surface waters. If Tennessee follows the majority of jurisdictions, it will adopt a reasonableness standard. The builder of the proposed project would be liable if the pollution of the surface water was unreasonable. The court would examine the character of the surface waters and the value of the activity.

Second, in an attempt to prevent contamination the builder of the proposed project may retain all of the surface waters which would normally flow onto lower lands. The courts in Tennessee have not decided the question of whether or not the owner of land may appropriate all surface waters which are found on his land. Most of the courts which have decided the issue have held that the owner of land may retain all surface waters. If the courts in Tennessee follow this trend, the builder of the proposed project would be allowed to retain all surface waters.

## Law of Groundwater

Description--

The courts in Tennessee have adopted the reasonable use theory regarding use of groundwaters. Although the courts have announced very few cases dealing with the use of groundwaters, the law appears to be settled.

In *Nashville, Chattanooga & St. Louis Railway v. Rickert* (422), the defendant pumped water from an aquifer to supply a bathing pool. The same aquifer had served the plaintiff, a railroad company, for many years. The groundwater from this source was not adequate to serve both uses if the defendant continued to operate at full capacity. In enjoining the defendant from interfering with the right of the plaintiff to obtain an adequate supply of water, the court stated:

> According to the English or common-law rule, a landowner had the right to dig a well on his land and collect therein subterranean percolations which he might use as he pleased, even if

> he thereby destroyed the source of supply of wells or springs on the lands of others. This rule was followed in some early decisions in American states other than Tennessee, but the modern rule and 'the better rule is that the rights of each owner being similar, and their enjoyment dependent on the action of other landowners, their right must be correlative and subject to the maxim that one must so use his own as not to injure another, so that each landowner is restricted to a reasonable exercise of his own rights and a reasonable use of his own property, in view of the similar rights of others.' (423)

Although the courts in Tennessee have applied a reasonable use test to determine liability for the use of groundwater, it appears that they have applied a strict liability test to determine liability for the pollution of groundwater. In *Sinclair Refining Co. v. Bennett* (424), gasoline stored by the defendant leaked into wells owned by the plaintiff. The court sustained a judgment awarding the plaintiff damages for polluting her wells based upon proof of a causal connection between the contamination and its source. The court held that the measure of damages was the difference between the value of the property before the wells were polluted and the value of the property after the wells were polluted. This determination was based upon the fact that the injury was permanent. In *Love v. Nashville Agricultural and Normal Institute* (425), the wells owned by the plaintiff were contaminated by sewage from the institution operated by the defendants. The court stated: "It is a well-settled law that if a person render the water of another impure by filth, offal, or other substance, to his injuries, he thereby creates a nuisance, under our statute as well as the common law, which can be abated as such" (426). The court enjoined the defendant from maintaining this nuisance and awarded damages for injury to the reputation of the spring as pure, for loss from sale of the water, and for reduction in the value of the property.

### Implications for Land Application Systems--

The Tennessee cases which deal with groundwaters may present the following problems to the builder of the proposed system. First, water from the site of the proposed project may pollute groundwaters. The courts in Tennessee appear to apply a strict liability standard to cases which deal with the pollution of groundwaters. In these cases the plaintiff proves his case when he establishes a causal connection. If water from the proposed system contaminates groundwater, the builder faces the likelihood of liability. The most promising aspect of this area of the law for the builder is that the cases are old. Perhaps a current court would modify the position taken by the court in these cases.

Second, water from the site of the proposed system which seeps underground might interfere with surface drainage on other property. The existing cases offer little guidance in determining the legal consequences of this situation. The hard line assumed by the courts in Tennessee in cases which involve the pollution of groundwaters indicates that the court may assume a similar position in cases which concern the enlargement of groundwaters.

### Summary

The Tennessee law does not appear to be as favorable to land treatment systems as the laws in some other riparian states. Many of the questions concerned with on-land application of wastewaters have not been presented to Tennessee courts. In addition, the Department of Public Health has some administrative guidelines (367) that could be very restrictive when applied to a particular situation. These guidelines, however, are used only as design criteria and each application for a permit to establish a land treatment system is evaluated on an individual basis (387). Data relating to annual precipitation, water balance calculations, effluent storage, and the proposed site's topography, geology, soils, and existing vegetation must accompany the permit application.

## WISCONSIN

### Law of Natural Watercourses

Description--

Wisconsin is basically a riparian theory state (427). The usually simple categorization of a state as appropriative or riparian is complicated in the case of Wisconsin because the state, starting from a riparian common law, has enacted an extensive statutory structure that contains several elements of the theory of prior appropriation. Statutes are much more important to the private law of water rights in Wisconsin than in other riparian states. It can still be said, however, that Wisconsin is primarily a riparian theory state, except insofar as that doctrine has been modified by specific legislation.

There are a great number of decisions in Wisconsin that contain language to the effect that a riparian landowner has a right to the natural flow of a stream without significant diminution or alteration. Most of these are relatively early decisions; within the last forty years most of the Wisconsin decisions have followed the reasonable use rule. Although there are a few recent decisions applying natural flow terminology (428), the natural flow language appears only as *dicta* in cases won by the plaintiff under the reasonable use analysis (427).

Except for certain statutes that qualify the riparian theory, which will be discussed later in this report, Wisconsin is a typical reasonable use jurisdiction. The right of reasonable use is not a property right in an ownership sense, but is simply a right to use the water as it proceeds past the riparian's land (429). The question of what uses are reasonable is said to be a question of fact, to be determined case by case:

> [R]egard must be had to the subject matter of the use, the occasion and manner of its application, its object, extent and the necessity for it, to the previous usage, and to the nature and condition of the improvements upon the stream; and so also the size of the stream, the fall of the water, its volume, velocity

and prospective rise and fall, are important elements to be considered. (430).

Under this rule it has been held that even a substantial interference with flow may be reasonable if necessary to a beneficial use (431), and that the mere fact of injury to other riparians does not, of itself, prove that a use is unreasonable (432). As a consequence of cases such as these, Wisconsin is among the more liberal reasonable use states, permitting the operation of any legitimate use that is conducted in a reasonable manner. Among the uses that have been approved are watering of stock (433), production of hydroelectric power (434), and irrigation (435).

There are cases in Wisconsin indicating that there will be liability where a landowner can prove that he has been damaged by an unreasonable obstruction, diversion, or pollution of a natural watercourse. Analysis of a case may vary with the method of interference, however. While there are Wisconsin cases indicating that a temporary or seasonal storage of water can be reasonable, a total and permanent diversion or obstruction of a stream is *per se* unreasonable. Cases involving pollution, while probably subject to the same reasonable use standards as cases involving nonpolluting uses, do produce a frequent number of natural flow statements in judicial opinions. In the context of use of water for irrigation, Wisconsin, unlike some other riparian states, has never specifically distinguished between such a consumptive use of water and competing non-consumptive uses. It has been stated that in such a conflict the court would probably apply "...the reasonable use doctrine to determine whether the particular withdrawal was lawful under the attendant circumstances" (436).

Assuming that an aggrieved riparian could prove an unreasonable use of water by another riparian, he will be able to seek either money damages or injunctive relief. In either case the plaintiff will have the burden of proving invasion of a riparian right, including proof of actual damages by a preponderance of the evidence and proof that the damages were proximately caused by the defendant's conduct. In an action for money damages, Wisconsin follows the usual rule that for permanent harm, the proper measure of value is the difference in the market value of the affected land (437); and for temporary harm, damages will be measured by the loss in use or rental value to the owner (438).

A riparian plaintiff could also seek injunctive relief in place of or in addition to an action for money damages. Although there are many cases in Wisconsin granting injunctive relief for interferences with water rights, it is probable that Wisconsin would allow all of the traditional equitable defenses, including the doctrine of "balancing of the equities," or "comparative-convenience," as it is frequently labeled in Wisconsin. Although this doctrine was rejected in two early cases, in one of which it was specifically stated that neither "...public convenience, nor difficulty in avoiding the trouble can either justify or excuse the wrong..." (439), more recent decisions have limited these negative holdings to actions for money damages only. Numerous decisions have indicated that it is proper to deny injunctive relief, relegating a plaintiff to money damages only, because of the greater harm to be suffered by the public if an injunction were granted (440).

A third remedy that a private complainant has in Wisconsin, against conduct which allegedly interferes with the complainant's water rights, is to petition the public agency in charge of regulating the challenged conduct. Under section 144.537 of the Wisconsin Statutes, for example, the Department of Natural Resources is required to hold "...a public hearing relating to alleged or potential environmental pollution upon the verified complaint of 6 of more citizens filed with the department." In *Wisconsin Power & Light Co. v. Public Service Commission* (441), several hundred petitioners asserted that a dam operated by the power company caused damages to lower riparians and to fish and wildlife in the river below the dam because of the fluctuation in water level. The commission held a hearing and ordered the company to maintain its dam so as to comply with a minimum water level established by the commission. The company appealed and argued, among other grounds, that the persons who originally petitioned the commission lacked standing to sue. The court rejected this assertion, stating that:

> Private persons have an interest in the navigable streams of the state... It must also be noted that sec. 4, art. I of the Wisconsin constitution provides that the right to petition the government or any department thereof shall never be abridged. Thus the original petitioners were acting within their constitutional rights when they brought the matter to the attention of the commission. In addition thereto some of the original petitioners were riparian owners of lands located on the river below the dam or had other interests in property there located. The commission was fully justified in conducting the hearing based upon that complaint. (442)

Thus, the remedies available under Wisconsin's private law of water rights are fairly broad. While an on-land application system is no more likely to be successfully sued for money damages or an injunction issued against them in Wisconsin than in other riparian states, and while administrative control in Wisconsin is not particularly onerous, the ability of downstream riparians--and even non-riparian members of the general public--to invoke administrative processes and compel the holding of public hearings makes litigation a more likely possibility in Wisconsin than in most other states. The fact that even individual members of the general public may have standing to complain to the appropriate agency does not increase the likelihood of a claim for money damages or an injunction being successfully asserted, because the remedy available to the complainants in that context would be limited to an order of the agency to prevent continuation of any wrongful act. Thus, the land application system could only be compelled by this process to comply with the administrative rules of which it was already aware and with which it will be presumably attempting to comply. But the possibility of vexatious litigation by a small handful of persons is necessarily increased.

Certain statutes that qualify the riparian right also have a substantial impact on the law of natural watercourses in Wisconsin. Although Wisconsin is primarily a riparian state, an extensive statutory structure places broad power in the Department of Natural Resources to allocate various aspects of water among competing claimants. Among the powers exercised by the department are the power to: (1) regulate the level and flow of water in navigable watercourses (443); (2) grant permits to deposit material or place structures in navigable watercourses (444); (3) grant permits to change the course of a navigable stream (445); (4) grant permits to construct an artificial waterway within 500 feet of a navigable body of water (446); (5) grant permits for construction of dams in or private bridges across navigable waters (447); (6) grant permits to divert water from surface streams for mining operations (448); and (7) grant permits to divert water from a stream "for the purpose of agriculture or irrigation," or to temporarily divert surplus water to maintain the normal level or flow of a navigable lake or stream (449). Several of these functions, and particularly the powers relating to diversion of water for mining and agricultural purposes, construction of dams, and maintenance of lake and stream levels, directly affect the allocation of water, and can produce results at variance with what would normally occur in a purely riparian jurisdiction.

For present purposes, the most important power granted to the Department of Natural Resources is to regulate diversion of water for irrigation or agricultural purposes. This power, which has a highly complex history, is currently found in section 30.18 of the Wisconsin Statutes, which provides:

> (1) Where Diversion is Lawful.
> (a) It is lawful to temporarily divert the surplus water of any stream for the purpose of bringing back or maintaining the normal level of any navigable lake or for maintaining the normal flow of water in any navigable stream, regardless of whether such navigable lake or stream is located within the watershed of the stream from which the surplus water is diverted. (450)
>
> (b) Water other than surplus water may be diverted with the consent of the riparian owners damaged thereby for the purpose of agriculture or irrigation but no water shall be so diverted to the injury of public rights in the stream or to the injury of any riparian located on the stream, unless such riparians consent thereto. (451)
>
> (2) Surplus Water Defined.
> Surplus water as used in this section means any water of a stream which is not being beneficially used. The department may determine how much of the flowing water at any point in a stream is surplus water. (452)

The remaining portions of section 30.18 of the Wisconsin Statutes delineate the procedures for obtaining a permit, with the total effect of the statute being to require that a permit be obtained for the temporary diversion of surplus waters, and for the diversion of waters other than surplus waters for agricultural or irrigation purposes. Consent of riparian owners damaged thereby is also needed before diversion of nonsurplus waters for agriculture or irrigation is lawful.

Section 30.18 of the statutes is important in considering Wisconsin's law of natural watercourses for two reasons. One, because a land application system may have to obtain a permit under this section, and if a permit is required, other riparians may be able to block the system's operation. Two, because this section's existence and operation may modify (in many situations where the stream's use is for agricultural or irrigation purposes) the water law analysis that would otherwise occur under the riparian, reasonable use common law that exists in Wisconsin.

The determination of whether compliance with section 30.18 is necessary hinges on the interpretation of several of the statutes' terms, including "diversion," "surplus water," and "agricultural or irrigation." The latter phrase is most important for the purposes of this report; the characterization of the purpose of the on-land disposal project will control whether a permit is required and whether the consent of downstream riparians must be obtained before the water may be diverted in this manner. If the project's major purpose can be effectively characterized as being pollution control, improved sewage treatment, or the like, the permit and consent requirements can be avoided. On the other hand, characterizing the purpose as agricultural or irrigation may cause problems; although the permit procedure established by section 30.18 is not unduly onerous, the effective veto allowed to downstream riparians is troublesome. The Wisconsin Attorney General has defined downstream riparians as "...those along the entire length of the stream below the proposed diversion and to such a point where the stream flows into a larger stream and loses its identity" (453). Using this definition, downstream riparians could often number in the hundreds, with the good possibility that someone will disagree with the proposed use and veto the project.

Another possible way to avoid the impact of section 30.18 of the statutes would be to argue that, since the system is diverting wastes, not water, it does not fall within the statute. There is no legal authority considering the validity of this argument. In a situation where *only* wastes are diverted, it would appear to be persuasive; but in a situation where the system's normal operation diverts some water as well as wastes, it is equally arguable that the diversion of water, even incidental to diversion of wastes, requires a permit.

In addition to the possible need to secure a permit, it is important to note that the existence of section 30.18, together with the power it gives to competing riparians, introduces an element of prior appropriation theory into the Wisconsin law of natural watercourses. Two recent and related decisions are instructive in this regard.

In *Omernik v. State* (454), the defendant was charged with violating section 30.18(3) of the Wisconsin Statutes by diverting waters other than surplus waters from Flume Creek and Klondike Creek for agricultural or irrigation purposes. After conviction, he appealed, raising several questions regarding the scope and validity of the statute. The supreme court held that: (1) the statute applied to diversions from non-navigable as well as navigable streams; (2) the permit requirement was not limited to stream-to-stream diversions; (3) a permit was required for irrigational diversion of surplus water; (4) the permit requirement did not deny defendant equal protection of the laws; and (5) the statute did not deprive defendant of property without just compensation.

The defendant Omernik had argued that the statute deprived him of property without "just compensation" since the riparian right to use water had been clearly stated in prior Wisconsin decisions to be a "property" right and the statute did not provide for compensation of the loss of this right. This would appear to be, on the surface at least, a strong argument, but the supreme court responded by stating that there was a distinction between the power of eminent domain and the police power:

> The former recognizes a right to compensation; the latter does not. Without repeating the extended analysis of ... the distinction between eminent domain and police power in ... *Just v. Marinette County*, we see sec. 30.18, Stats., as the state's exercise of its police power to protect public rights and to prevent harm to the public by uncontrolled diversion of water from lakes and streams. While the statute does not secure for the state a benefit not presently enjoyed by its citizens, it does seek to prevent the public harm of dry riverbeds replacing flowing streams. (455)

Consequently, in the second case arising out of the same basic fact situation, *Omernick v. Department of Natural Resources* (456), the same riparian owner (note different spelling of name), now the plaintiff attacked other aspects of section 30.18 of the Wisconsin Statutes. The plaintiff argued, among other grounds, that the basic permit procedure of section 30.18 violated due process "... because it provided no means by which the rights of riparian owners could be determined and yet granted to each riparian owner who was beneficially using the waters of the streams a veto over the granting of the irrigation permit without any showing of injury" (457). The Wisconsin Supreme Court agreed that:

> Because the department does not have the power to grant a permit over the objection of other riparian proprietors, the plaintiffs in this case have no means of securing a permit for the irrigation they contemplate when objection is made. Thus, they have no means of enforcing a common law riparian right of irrigation. This is because irrigation is prohibited without a permit. (458)

However, the court concluded that this implicit abrogation of the common law riparian right of irrigation did not make the law unconstitutional. Conceding that the permit procedure had the result of introducing an element of prior use in the Wisconsin water law which was not there at the common law, the court concluded that the wisdom of this policy may be debatable, but it is a legislative, not a judicial determination.

Thus, Wisconsin is no longer purely a riparian state where a proposed diversion is for agricultural or irrigation purposes. Given a broad interpretation of section 30.18 of the statutes adopted by the Wisconsin Supreme

Court, it can be seen that the posture of an on-land application system under the Wisconsin law of natural watercourses will depend to a great degree on its characterization as "agricultural or irrigation," or as something else. If the system is "agricultural," and will involve the diversion of any water from a natural watercourse, its rights to what water will be determined by the appropriative structure of section 30.18. If the system can be characterized as other than "agricultural" (or "irrigation"), or if it envisions no diversion of water from a watercourse, section 30.18 will be irrelevant and its operation will be determined in accordance with the other Wisconsin regulations and Wisconsin's basic riparian common law. Insofar as the question presented involves possible trace pollutants returned *to* the watercourse, rather than diversion *from* a watercourse, section 30.18 is again irrelevant and the result of a particular case will be determined under the reasonable use standards outlined above.

### Impications for Land Application Systems--

The Wisconsin law of natural watercourses, as expressed by the Wisconsin Statutes and cases, does not distinguish between the different types of land application systems. This law is concerned instead with the *effect* of any proposed use on the quality and quantity of the water flowing in a natural watercourse. Wisconsin's Department of Natural Resources, however, has administrative regulations governing systems utilizing land disposal of liquid wastes (459). These regulations do make a number of distinctions between various methods of application, such as absorption pond systems, ridge and furrow systems, spray irrigation systems and septic tank/field absorption systems, which distinctions will be discussed later (460).

With regard to possible interference with the flow of a natural watercourse, Wisconsin law has generally favorable implications although it does present one problem not found in other riparian states. For the purpose of determining whether the application system is a reasonable use of water, any of the possible methods of application would be considered to be "irrigation" within Wisconsin law, and Wisconsin has held that irrigation is a reasonable use of the waters of a natural watercourse. Also, since Wisconsin has enacted regulations specifically covering land application systems, such systems have, in effect, been determined by the legislature to be reasonable as long as operated with certain precautions.

Even though a water use is reasonable, litigation by a downstream riparian remains a possibility, in Wisconsin as in other riparian states. In addition to the basic problem of possible litigation, a possibility Wisconsin shares with other riparian states, there is one legal problem that is unique to Wisconsin. Specifically, if the land application system is deemed to be "irrigation" within the meaning of section 30.18 of the 1975 Wisconsin Statutes, a separate permit will be required before diversion of water will be allowed, and under that section any downstream riparian can veto the permit and, consequently, the entire project.

As in other riparian states, however, there are several steps that can be taken in the establishment and operation of land application systems to minimize all of these possibilities of liability. In addition to the recommendations outlined for Arkansas and for natural watercourses in riparian states in Volume I of this report, the following recommendations pertain exclusively to Wisconsin.

1. In establishing sites for land application systems, it should be determined whether the stream in question has been designated a "trout stream" by the Department of Natural Resources within the meaning of section 30.18(5) of the Wisconsin Statutes. If it has been so designated, even surplus waters may not be diverted without a permit.

2. In establishing the system, as a practical matter care should be given to how the system is characterized. In other riparian states, it is best to characterize the system, for water use purposes, as a form of "irrigation," since irrigation is a permissible use of water in all riparian states. While this is equally true under Wisconsin's basic water law, in Wisconsin a characterization of the system as "irrigation" might require compliance with section 30.18 of the statutes. However, characterizing the system as "pollution control" or "pollution abatement" would assist in avoiding the provisions of that section.

   If the matter were ever litigated, the court or agency would make its own decision regarding whether the application system met the definition contained in section 30.18, but the label applied by the system operators to their system could be legally relevent. This does not mean that the word "irrigation" can never be used or mentioned in connection with a land application system, but that in Wisconsin it will always be advisable to emphasize the other aspects of the system as well.

3. Because of the problem with section 30.18 of the statutes, serious thought should be given in Wisconsin to entirely avoiding diversion of wastes *from* a natural watercourse (as opposed to diversion *before* the wastes enter a natural watercourse). If no wastes are diverted from watercourses, no waters will be diverted either, and section 30.18 will not apply to the system, without regard to how the system is characterized.

The second way in which the law of natural watercourses intersects with land application systems is if, after application, trace contaminants remain on the land and are eventually washed into a natural watercourse, if, in a particular situation, some contaminants drain into a natural watercourse, then the following consequences may ensue. It is clear that there can be liability in Wisconsin for the pollution of the waters of a natural watercourse. This can occur even with a use that is "reasonable;" it being recognized that even reasonable uses may harm other interests and should compensate those harmed as part of the cost of operation. Although, in legal theory, the relief an injured party could receive could include either money damages or an injunction, as in other riparian states the likelihood of either type of relief being awarded is remote.

The factor which makes Wisconsin law slightly less favorable for our purposes than the law of other riparian jurisdictions is that, unlike most other states, Wisconsin does not limit the power to sue for harm to a natural watercourse to downstream landowners. While only such a landowner could seek money damages for harm to land, under the "public trust" doctrine a casual citizen in Wisconsin could start either judicial or administrative proceedings for injunctive relief. This broad right to sue does not increase the likelihood of the system's being enjoined; it does, however, increase the possibility of litigation.

As is true in other riparian states, there is no way the system's operators can totally eliminate the possibility of liability for trace pollution of a natural watercourse. Even if all necessary operation permits under Wisconsin law are secured, these permits do not shield the operator from possible liability; they would at best be strong evidence of reasonable conduct in a water rights lawsuit. There are, however, several steps that can be taken to minimize the possible risk. In addition to the recommendations previously mentioned for Arkansas and natural watercourses contained in Volume I of this report, pertinent Wisconsin administrative regulations, discussed later, should be observed.

## Law of Surface Waters

### Description--

Wisconsin defines surface waters as including "...waters from rains, springs or melting snow which lie or flow on the surface of the earth but which do not form part of a watercourse or lake" (461). As in the case in other riparian jurisdictions, there is a distinction in Wisconsin law between a landowner's right to use the surface waters that come to his land and his right to alter or obstruct the flow of surface waters that come to his land and his right to alter or obstruct the flow of surface waters across the land of others. Although there is no Wisconsin decision specifically determining the ownership of diffuse surface waters, it has been stated that "...standing water may be held in private ownership" (462). It has also been held that riparian rights do not apply to diffused surface waters, and that a lower landowner has no right to insist on the flowage of surface waters onto his land if the upper landowner decides to use the water before it leaves his land (463). It would appear, therefore, that in Wisconsin a person who collects diffuse surface waters on his own land owns that surface water and can use it without liability to adjoining landowners. An on-land application system that gathers surface waters with effluent, and does not discharge it across the land of another, would thus be immune from possible liability.

The law is somewhat different when the landowner's conduct causes either acceleration of surface waters across the lower lands, or diversion across lands which they would not ordinarily flow. Until recently, Wisconsin had been in a state of transition, having departed from the common enemy rule to a middle position incorporating elements of both common enemy and reasonable use analysis. Recently, however, Wisconsin has flatly rejected the common enemy rule and has adopted the reasonable use rule to resolve issues concerning surface waters. In *State v. Deetz* (464), the defendants purchased land on a bluff overlooking Lake Wisconsin for the purpose of building a residential subdivsion on what had previously been crop and pasture land. Erosion and runoff was minimal until construction began, but construction resulted in a large amount of sand washing down from the bluff, causing the formation of sizable deltas in the lake and impeding its navigability.

In vacating the lower court's order dismissing the complaint against the defendants, the Wisconsin Supreme Court rejected the common enemy rule because it no longer comported with the realities of our society, and adopted the reasonable use rule. Applying this rule, the court said: "We are satisfied that the gravity of the harm is *prima facie* provided by the evidence. That evidence, however, is but one side of the equation of reasonableness. The gravity of the harm is to be weighed against the utility of Deetz' conduct.... Accordingly, the cause must be remanded for further proceedings in order that the defendants may have the opportunity to submit evidence on social utility of their conduct" (465).

Since Wisconsin now follows the reasonable use rule with regard to surface waters, questions of possible liability for interference with such waters will generally be resolved in accordance with the reasonable use analysis as developed with regard to natural watercourses. Basically, the Wisconsin law has more favorable implications for land application systems when both pollutants and diffused surface waters are retained at the application site, than when both are dispersed to adjoining lands.

Implications for Land Application Systems--

In the case of trace pollution of surface waters crossing the lands of another person, Wisconsin has no law directly on point. Probably Wisconsin would apply its recently announced surface water rule of "reasonable use" to such pollution. That is, pollution for no valid purpose might be unlawful, but pollution in connection with an otherwise reasonable use might be lawful. Since, as we have established with regard to natural watercourses, land application systems are probably reasonable uses under Wisconsin case law, it would be very unlikely for a land application system in Wisconsin to be prevented from operating because of trace pollution of surface waters. Although the system operators might have to pay for damages caused to adjoining landowners, the possibility of such liability is even less likely in the surface water category than it is in the natural watercourse category. This is because: (1) the potential claimants for harm to surface waters will be limited to the immediately adjoining landowners, rather than including any person, as in the watercourse category; (2) the right to use surface water is not a "property" right as is the right to use the water of a natural watercourse; and (3) since less gainful use is generally made of surface waters, it is much more difficult for a claimant to prove the loss of a specific use and consequently, a decline in the market value of his land.

On the other hand, if the system collects both surface waters and trace pollutants on its property, there is no possibility of liability for interference with the flow of surface waters. It is clear that, as the lower landowner has no property right to the surface waters, he cannot insist on their continued flow. The upper landowner has the right to collect all surface waters on its property.

Given these basic principles, the recommendations for Arkansas and those contained in Volume I of this report for land application systems as they relate to surface waters in riparian states apply to Wisconsin. In addition, the Wisconsin Administrative Code specifically requires that in operating a land disposal system:

1. Effluent be alternatively distributed to different sections of the system in order to maintain the absorptive capacity of the soil, and, thus, minimize the carrying of pollutants into surface waters (466); and
2. Discharges be maintained within the system's perimeter, even if this involves also containing diffused waters--such as rainfall--within the system's perimeter (467).

### Law of Groundwater

Description--

Wisconsin's law of groundwater is still in a period of uncertainty, and has not reached the simple, reasonable use rule that Wisconsin applies to both natural watercourses and surface waters. The initial source of Wisconsin's groundwater law is the famous (or infamous) case of *Huber v. Merkel* (468), a decision that for years following its rendition was both cited and rejected far beyond the borders of Wisconsin.

In 1901 the Wisconsin legislature enacted a statute to preserve artesian water supplies (469). This statute provided that the user of an artesian well must use due care to prevent the waste of water, if that waste would unnecessarily diminish the flow of water in other artesian wells in the vicinity; and that a person who wasted water would be liable in damages to the person whose water flow was thereby diminished. The *Huber* case, which followed shortly thereafter, involved an area with about 30 artesian wells. Two of these were on Merkel's land, and he was the only well owner in the area who did not cap his wells when not in use. Indeed, the proof was that Merkel deliberately and maliciously allowed his wells to flow at full capacity all the time, with much water flowing away unused, in order to interfere with his neighbors' water uses. Neighbor Huber sued, and the Wisconsin Supreme Court held that a landowner could use the water from his well or let is run unused, regardless of the effect on other wells and regardless of his motivation. The case is known as the most extreme example of the rule of absolute ownership. All other states modified the absolute ownership rule at least to the extent of holding that the well-drilling landowner could not act maliciously. The *Huber* case remained the Wisconsin law for over 70 years.

Finally, in 1974, the Wisconsin Supreme Court overruled the *Huber* case. In *State v. Michels Pipeline Construction, Inc.* (470), the defendant pumped 55,000 gallons of water per minute from wells in order to lower the water table to a sufficient depth to permit tunneling to install a sewer system, approximately 40 feet below the ground surface. An action commenced by the State alleging that the pumping constituted a public nuisance was dismissed by the trial court which, following the *Huber* rule, held that there was no cause of action on the part of an injured person concerning his water table. On appeal, the supreme court overruled *Huber* and adopted the "American" rule. This rule states that one who withdraws groundwater from the land and uses it for a beneficial purpose is not subject to liability for interference with the use by another unless the withdrawal causes unreasonable harm. The court, in commenting on the scope of this rule, stated: "Thus the rule preserves the basic expression of a rule of nonliability--a privilege if you will--to use ground water beneath the land.... The rule would place the matter of cost on the same rational basis as the rule applicable to surface streams, the reasonableness of placing the burden upon one party or the other" (471).

Strictly speaking, however, the present rule in Wisconsin is not the same rule of "reasonable use" applied to surface streams. Instead, Wisconsin has adopted what may be considered an "unreasonable use" rule, that is, one which considers any use of groundwater *prima facie* reasonable, placing the burden of proving unreasonableness on any who allege they are being harmed. In addition, it should be noted that this standard is directed only at cases alleging *excessive use* of groundwater. The question of whether this standard would also apply in situations involving *pollution* of groundwaters has not yet been answered by the Wisconsin courts.

Wisconsin has only two reported cases where damages for pollution of percolating waters were sought. In *Anstee v. Monroe Light & Fuel Co.* (472), the plaintiff alleged, among other things, that large quantities of industrial wastes from the defendant's gas plant had contaminated his well, making the water unfit for domestic or any other use. In sustaining the trial court's judgment for both injunctive relief and money damages, the Wisconsin Supreme Court stated that the plaintiff's damages were special and an action for private nuisance maintainable, even though 20 other wells in the same vicinity had been similarly affected. In affirming the judgment, the supreme court did not discuss the reasonableness of the defendant's conduct.

In a later case, *Enders v. Sinclair Refining Co.* (473), plaintiffs brought an action for money damages alleging that seepage from defendant's oil storage tanks had contaminated their well. In its holding dismissing plaintiffs' complaint, the supreme court stated: "The burden of showing that there was no other possible source of pollution was on the plaintiffs. The defendant was not required to prove that pollution from other sources did enter plaintiffs' well, unless and until the plaintiffs showed there was no other possible source of pollution" (474).

While it is difficult to predict from these two cases the present Wisconsin court attitudes toward actions arising from the pollution of groundwaters, it is apparent that liability could ensue, but probably only under the theories of nuisance or negligence. This would allow room for proof of the reasonableness of the defendant's use in cases where injunctive relief is sought. It appears that meeting the requisite burden of proof would be a substantial problem for a potential plaintiff.

Implications for Land Application Systems--
With regard to the possibility of trace contaminants reaching groundwater supplies, Wisconsin law has reasonably favorable implications for establishment of land application systems. Although Wisconsin has not specifically adopted reasonable use analysis in the groundwater area, the rule it has announced is more favorable to the operation of land application systems than a reasonable use rule would be. Under a reasonable use rule, the system operators, as defendants in a lawsuit, would bear the burden of proving their use to be reasonable. Under the Wisconsin rule, however, there can be no liability unless the plaintiff succeeds in proving the use to be unreasonable. This shifting of the burden of proof improves the system's already strong legal posture, since it is highly likely that such a use would be said to be reasonable in Wisconsin.

From the point of view of the operators of a land application system, if liability were asserted because of pollution of a groundwater supply, the worst that could happen would be a similar analysis as would happen in a case involving pollution of a natural watercourse. Although suit in Wisconsin could be brought by any member of the public, most probably any action would be brought by nearby landowners. In order to recover money damages, those landowners would have to show that the system polluted a groundwater supply, that they were drawing from the same groundwater supply, that the polluted waters they drew harmed their land, and the specific decline in market value of the land. Although the same remedies are available as in the natural watercourse area, again an injunction is unlikely to be granted against a reasonable use, and money damages will be difficult to prove and will, in any event, be limited to a decline in market value. And, while some states apply a stricter standard to groundwater than to natural watercourses, and hold a polluter "strictly" liable--that is, liable without proof of negligence--Wisconsin does not seem to be one of these states. Even though the case law is sparse, it indicates that a plaintiff would have to show that the defendant was the sole cause of the pollution, and that the defendant could prove the reasonableness of its conduct as a defense, at least to a suit for an injunction.

Where the legal complaint is that, in the absence of pollution, groundwater recharge from an application site raises the water level of the groundwater, the plaintiff will have an even more difficult time in attempting to sue the system's operators. If there is no provable negligence in the operation of the system, and no intentional harm being done, there are no cases in Wisconsin allowing any recovery by such a landowner. The recently announced Wisconsin rule envisions the possibility of liability only in the case of withdrawals *lowering* the water table. At worst, a case involving the raising of water table would be treated under the same rules applicable to a pollution case; at best, there might be complete immunity from liability.

There are precautionary steps that can be taken to further minimize the possibility of liability. In addition to the steps outlined for Arkansas and in Volume I of this report relating to groundwaters for riparian states, the following provisions of the Wisconsin Administrative Code relate directly to land application systems and groundwater supplies:

1. During application, ponding is permissible under the Wisconsin regulations only as a temporary condition following precipitation (475);

2. If a ridge and furrow system is used, ridges should not be inundated except during precipitation (476);

3. In operation of the system, no discharge should exceed the maximum hydraulic loading rate, which rate will be specified in the permit received from the Department of Natural Resources (477); and

4. Groundwater monitoring should be undertaken in the area of the system, at locations specified in the Wisconsin Pollutant Discharge Elimination System (WPDES) permit (478).

## Summary

Statutory law, common law, and administrative regulations in Wisconsin all favor on-land application of wastes. The application of the reasonable use rules in cases concerning natural watercourses and diffused surface waters, and the use of the modified rule of capture in cases concerning groundwaters, serve to create a reasonably favorable legal climate for an on-land application system operating within the requirements of the pertinent administrative regulations.

A proposed on-land application system would have to comply with the local zoning regulations of the particular locality; due to the wide variations in local regulations, discussion of local zoning is beyond the scope of this report. More importantly, the proposed system would have to comply with the provisions of chpater NR 214, Wisconsin Administrative Code, in order to receive a permit to operate from the Department of Natural Resources. The Department of Natural Resources is directed by statute to "...encourage the design of publicly owned treatment works which provide for the recycling of sewage pollutants by using them in agriculture, silviculture or aquaculture" (479). In furtherance of this goal, the statutes also require that all plans submitted for new treatment works contain a "...feasibility plan on using ultimate disposal of pollutants to land rather than to air or the waters of the state" (480).

The Department of Natural Resources, drawing its powers from chapter 147 of the Wisconsin Statutes, has promulgated administrative regulations applicable to facilities licensed under that chapter using land disposal of liquid wastes (459). These regulations establish discharge limitations and monitoring requirements applicable to discharges of liquid wastes to land disposal systems from publicly owned treatment works, privately owned domestic waste treatment works, and point sources (481). "Land disposal systems" are defined to include either an absorption pond system, a ridge and furrow system, a spray irrigation system, and/or a septic tank and field absorption system (482).

The owner or operator of such a system is required to monitor discharges of liquid wastes and pollutants, and to comply with the discharge limitations of chapter NR 214 of the Wisconsin administrative Code. Basically, it is provided that no discharge shall exceed the maximum hydraulic loading rate, which rate will be specified in the permit and will have been determined by the Department of Natural Resources after considering the system's design capacity, past operating performance, site conditions including soil and geological characteristics, and other relevant data (483). In addition, there can be no discharge of private domestic waste or municipal waste to either an absorption pond system, ridge and furrow system, or spray irrigation system without prior secondary sewage treatment (484).

In addition to these basic requirements, there are more specific discharge regulations aimed at each type of land disposal system. Absorption pond systems are further restricted by the requirement that discharges to such systems be retained within the system's perimeter (467), and a number of specific requirements are directed at spray application systems, including: (1) confining of discharge during irrigation to the perimeter of the system (485); (2) alternate distribution of discharge to different sections of the system to maintain the soil's absorptive capacity (466); (3) limiting volume to prevent ponding except for temporary conditions following precipitation (475); and (4) keeping the discharge free of materials that will interfere with the operation of spray nozzles (486). Ridge and furrow systems also are required to retain discharges within the system's perimeter, to allow alternate distribution of discharge to different sections, and to prevent inundation of ridges except following precipitation. Finally, in addition to the basic requirements, septic tank and field absorption systems must be limited to prevent flow to or ponding upon the ground surface (487).

Chapter NR 214, Wisconsin Administrative Code, also establishes detailed requirements for monitoring both discharges and groundwater. Several of the discharge monitoring requirements vary with the type of facility from which discharge is made. Thus, discharges from aerated lagoon facilities must be monitored at least daily for pH and weekly for BOD, suspended solids, and fecal coliform bacteria (488); discharges from stabilization pond facilities operated as a flow through system must be monitored weekly for pH, twice monthly for BOD and suspended solids, and twice quarterly for fecal coliform bacteria (489); and discharges from stabilization pond facilities operated on a fill and draw basis must be monitored daily for total daily flow, weekly for total daily flow and pH, twice monthly for BOD and suspended solids, and twice quarterly for fecal coliform bacteria (490). Other discharges to land disposal systems must be monitored for total daily flow, with the frequency of the monitoring varying with the system's hydraulic capacity (491).

Groundwater monitoring is generally required at locations specified in the Wisconsin Pollutant Discharge Elimination System (WPDES) permit (478).

Groundwater monitoring will be required in all cases; the frequency of which depending upon the total daily flow:

1. Monthly for systems with hydraulic capacity of 20,000 gallons per day or less (492);

2. Weekly for systems with a hydraulic capacity of more than 20,000, but less than 100,000 gallons per day (493); and

3. Daily for systems with a hydraulic capacity of 100,000 gallons per day or more (494).

Once the system receives its permit under chapter NR 214, it is free to operate. Obviously the limitations set forth in the permit, most particularly the discharge and monitoring requirements, must continue to be met.

Even after the chapter NR 214 permit is obtained and complied with, it is always possible that private persons could institute legal action in Wisconsin because of real or perceived grievances caused by the system's operation. Even though proof of compliance with the permit would be evidence that the system was not a legal nuisance, compliance with the permit does not bar a lawsuit. Since, as has been discussed, the typical on-land application system can alter traditional drainage patterns of surface water, groundwater, and natural watercourses, a lawsuit on any of the theories herein discussed is always possible. Indeed, there is more chance of litigation in Wisconsin than in other riparian states, because in many instances the ability to sue is not limited to downstream riparian landowners.

As long as the permit is being complied with, however, there is little chance of a system operator being successfully sued for damages or an injunction. Wisconsin's substantive water law in all categories of determination--judicial, statutory, and administrative--is favorable to the development and operation of a carefully run land application system.

# SECTION 4

# APPROPRIATION STATES

## ARIZONA

### Law of Natural Watercourses

Description--

Arizona, one of the eight Colorado Doctrine states, recognizes the principles of prior appropriation as the only system of water rights suitable to the state's arid environment (495). However, unlike its neighbor Colorado, Arizona has incorporated the doctrine of prior appropriation into an all-inclusive pattern of statutory regulation. The basis of the regulation is the classification of certain types of water as appropriable and, therefore belonging to the public (496). Accordingly, this statutory classification operates as a limitation and "...excludes all waters not included therein" (497).

Supervision and control over state waters resides in the Arizona State Land Department (498), to which one must apply to receive a permit to appropriate water. The statutory requirements for receiving a permit are set forth later in this report. In addition to the statutory requirements, Arizona is one of several states with specific regulations governing use of reclaimed wastes on land (499). These regulations will also be discussed later.

The definition of natural watercourse prevailing in Arizona does not differ significantly from that accepted in other appropriation jurisdictions:

> A stream is a watercourse having a source and terminus, banks and channel, through which waters flow, at least periodically. Streams usually empty into other streams, lakes, or the ocean, but a stream does not lose its character as a watercourse even though it may break up and disappear. Streams are usually formed by surface waters gathering together in one channel and flowing therein. The waters then lose their character as surface waters and become stream waters. As we have observed, a continuous flow of water is not necessary to constitute a stream and its waters stream waters. (500)

Mere surface drainage resulting from unusual freshets or other extraordinary causes does not qualify as a watercourse under the definition accepted in Arizona (501). On the other hand, the Arizona courts have interpreted the definition of natural watercourse to include ravines or washes where there exists a well-defined channel, even though water flows at irregular intervals and arises from an intermittent source.

The right to appropriate waters classified as appropriable by the Arizona legislature is given to any person, and he who is first in time, is first in right (502). This right is contingent upon one's complying with the necessary statutory procedures concerning the securing of a permit to appropriate water (503). Among the elements enumerated in the statutes to be considered by the State Land Department in granting a permit are:

> A. As between two or more pending conflicting applications for the use of water from a given water supply, when the capacity of the supply is not sufficient for all applications, preference shall be given by the department according to the relative values to the public of the proposed use. (504)
>
> B. The relative values to the public for the purposes of this section shall be:
>
> 1. Domestic and municipal uses....
> 2. Irrigation and stock watering.
> 3. Power and mining uses.
> 4. Recreation and wildlife, including fish. (505)

Although the foregoing statute appears to establish a preference relationship among the listed uses, it is still unclear whether or not this relationship is a "true" preference. If so, "...the preferred use (could) be exercised without regard to other classes of users or their priority rights and without payment of compensation" (506). However, the statutes clearly state that:

> A. The department shall approve applications made in proper form for the appropriation of water for a beneficial use, but when the application or the proposed use conflicts with vested rights, is a menace to public safety, or is against the interests and welfare of the public, the application shall be rejected. (507)
>
> B. An application may be approved for less water than applied for if substantial reasons exist therefore, but shall not be approved for more water than may be put to a beneficial use.... (508)

Since this provision allows the department to exercise broad discretion in approving or disapproving an application for a permit to appropriate water, considerations of preference may effectively be eliminated. In other words, the department may establish any number of limitations upon a use of water before granting a permit to a prospective appropriator, consequently providing for the protection or promotion of desirable uses. In any event, the department is obligated to respect, and the state law recognizes and protects, existing vested rights in water.

If the application for an appropriation permit is approved, the applicant can complete his diversion works or other necessary construction and apply the diverted water to a beneficial use in order to perfect his appropriation (509). The construction must be started within two years after the approval of the application is given; it must be prosecuted with reasonable diligence and completed within a reasonable time, not to exceed five years from the date of approval, unless an extension of time has been given by the department (510). As to what date is important in establishing priority among the permittees, it is generally the law in most jurisdictions requiring permits that the date of the application will control (511). This appears to be the case in Arizona, although there is case law to the effect that, since the right to appropriate water is a contingent right under the permit system, a person's priority dates from the time when full compliance with the statutory procedures is complete (512). This rather vague statement could be interpreted to mean that an actual beneficial use must be initiated before perfection of the right and priority are obtained. However, the more consistent reading would require only that the application meet the requisites of the Arizona statutes and consequently, the date of priority would be the date of the filing of the application (513).

A decision made by the Arizona State Land Department respecting a particular application for a permit to appropriate is appealable by either the applicant or any other person whose rights are affected thereby. However, in a situation where a party claims that a decision to allow a permit to appropriate water violates his prior existing rights to appropriate water from the same watercourse, because all the water sought to be appropriated by the applicant has already been appropriated, the party objecting has no right of appeal for the reason that, under the procedure established for the granting of a permit the department can in no way affect the vested rights of prior appropriators (514).

Conflicts as to the relative rights of appropriators on a particular body of water are resolved by petitioning the State Land Department for a hearing as to the claims. The department has the power to hear and take testimony, and make necessary examinations to determine the respective rights. However, if a court has previously determined rights to the water as between the contesting parties, or if a court has made a determination as to the respective dates of appropriation, these are binding on the department and cannot be abrogated thereby.

In Arizona, as in other Colorado Doctrine states, a senior appropriator cannot be deprived of his rights to the waters by subsequent appropriators, either through diminishing the quantity or the quality of the water used by the senior right (515). If a junior appropriator should interfere with the senior's ability to obtain the senior's permitted quantity of water, the senior appropriator may be able to compel the junior user to deliver the requisite amount of water at designated points and at the junior's expense (516).

Just as a junior appropriator is prohibited from adversely affecting a senior's right to water, a senior water user owes a duty to avoid harming subsequent users when seeking to expand or change his particular use (517). A prior appropriator's injurious practices may be stopped by a "proper" action, that is, an action for abatement. A junior right may also compel a senior use to release water which the senior right cannot beneficially use (518). In addition to available civil remedies for harm done by both junior and senior users, Arizona Statutes provide for criminal penalties for the violation of the regulations governing the use of appropriable water (519).

Thus, if the withdrawal of wastes from a natural watercourse also involved the withdrawal of stream water, the system operators would have to comply with the statutory permit requirements. A stipulation as to the amount which would be allowed to be diverted would be made; and any subsequent increase in water drawn would have to be approved by the State Land Department. No withdrawal would be allowed if such would interfere with prior existing rights on the stream.

Pollution of any appropriable water source is actionable, for to allow any water user to pollute his source is to effectively allow that individual to deprive all other users of their legally authorized appropriation (520). The extent of the pollution and its harm to other users is a factual question, and, in order for a plaintiff to receive relief under the law, he must show a substantial injury. Thus, if a land application system contaminated a natural watercourse to the extent of causing a substantial injury to any appropriator (be they junior or senior to the waste diversion), the waste diversion system would be liable for the damage done.

The general rule of "first in time, first in right" also controls the distribution of water between appropriators during periods of water scarcity:

> During years when a scarcity of water exists, owners of land shall have preference to the water for irrigation according to the dates of their appropriation or their occupation of the lands, either by themselves or their grantors. The oldest titles shall have precedence. (521)

This reference to older titles having preference over subsequent ones is not a true preference, but a confusion of preference with priority.

The right to the diversion of water is a right appurtenant to the land upon which the water is used:

> ...a water right is attached to the land on which it is beneficially used and becomes appurtenant thereto, and that the right is not in any individual or owner of the land. It is in no sense a floating right, nor can the right, once having attached to a particular piece of land, be made to do duty to any other land, with certain exceptions, *e.g.*, where the land is washed away. (522)

The exceptions to the appurtenance rule can be found in the Arizona statutes, which allow for transfers of water rights and place limitations upon any severance or transfer sought by the individual water user (523).

The statute, however, does not apply to the situation where the appropriator merely wishes to change his use without transferring it to other lands. A change in the place of use can be accomplished as long as it does not impair other existing rights, be they senior or junior to the water user seeking the change (524), but a change in the nature of the use of water cannot be made without the approval of the Arizona State Land Department. The department is authorized to rule on petitions for changes in use of water appropriated for domestic, municipal, or irrigation uses.

Implications for Land Application Systems--

Arizona law makes no provisions for a preferred method of land application of wastes. The major concern of the law governing water use is that any proposed diversion must be made for a beneficial purpose. Arizona law will have the following implications with regard to the possible effect of an application system on the *quantity* of flow of a watercourse.

1. Since the majority of natural watercourses in Arizona already have existing appropriative activity, it is clear that a diversion system for land application on a particular watercourse will be subject to water quantity limitations imposed by the mere fact of the pre-existing water use right.

2. Moreover, even though the land application system will likely be considered irrigation and, thus, have preference over a majority of other uses (except domestic uses), preference is not as significant a concept in Arizona as it is in Colorado because of the broad discretion of the State Land Department.

3. Any appropriation for waste purposes junior to any other appropriative right will be liable for compensation if the appropriator requires a quantity of water which will adversely affect the earlier right's duty.

4. Any pollution caused by a waste system which causes substantial harm to a downstream appropriator must be compensated regardless of any "priority" or "preference" relationship.

5. It is possible, although not certain, that in order to obtain a permit to appropriate water from a stream for use in connection with a land application system, an estimate of the quantity of water needed and the contaminants expected to escape into the watercourse may have to be submitted to the State Land Department for consideration before a permit will be issued.

In an effort to minimize interference with other appropriative rights because of impact on quantity of flow, and therefore avoid liability for damages, the steps outlined for the establishment and operation of a land application system under the law of natural watercourses for appropriation theory states in Volume I of this report should be followed in Arizona.

The second way in which the law of natural watercourses intersects with land application systems occurs if, after application, trace contaminants drain into a natural watercourse. If this occurs in a specific situation, then the following consequences may ensue. Since an appropriator's right to the use of the waters of a natural watercourse is not absolute, there can be liability for pollution of those waters. This liability also extends to stream waters to which the former stream is tributary. Money damages and injunctive relief are available to the injured parties, but it is unlikely that a "beneficial" use such as land application of waste (irrigation) will be enjoined. However, money damages will be assessed for any proven and substantial injury. There is no way the system's operators can totally eliminate the possibility of liability for trace pollution of a natural watercourse, but the steps outlined in Volume I of this report and mentioned above can be taken to further minimize the possible risk. In addition to the more general precautions, regulations of the Arizona State Department of Health Services require that all applied effluent must receive either secondary treatment, secondary treatment plus disinfection, or tertiary treatment plus disinfection, prior to application depending on the use to be made of the effluent (525).

## Law of Surface Waters

### Description--

Surface waters in Arizona have to be divided into three categories--diffused surface waters, waste and seepage waters, and salvaged and developed waters.

Diffused Surface Waters--The ownership of diffused surface waters remains in doubt in Arizona, although a recent case has held that such waters are not subject to the statutory procedures on appropriation. In *Espil Sheep Co. v. Black Bill & Doney Parks Water Users' Association* (526), the court reasoned that surface waters are characterized by shortlived flows, spread over the ground and not concentrated in bodies of water conforming to the definition of lakes or ponds. Consequently, since the Arizona Statutes provide only that certain types of water (predominantly well-defined bodies of water) are subject to appropriation, "surface waters" are not included therein (527). Diffused surface waters, then, can arguably be used by the landowner without complying with the statutes on appropriation.

> In Arizona only waters specified in the statutes are subject to appropriation. However, if the common-enemy rule on the question of liability is followed, a landowner may find it advantageous to divert diffused surface waters in such a way as to make use of them; stock-watering tanks are examples. By the general rule, such water on his property would belong to the landowner. However, if Arizona were to adopt the Colorado rule on tributary flows, the result would be different. (528)

Although it is still unclear which particular rule (civil law or common enemy) applies to the disposition and use of diffused surface waters, certain principles have emerged from the case law. It is clear that no landowner can collect diffused surface water flowing across his land, direct it through an artificial channel, and "...discharge it in large quantities upon the land of a lower owner to his damage" (529). However, an interference with watershed drainage on the part of an upper landowner, such drainage normally coursing to an existing wash or ravine which has served as a channel for such runoff, does not lead to liability for damage done by waters running through the ravine and over on a lower landowner's property, if such interference did not create an excess of runoff into the ravine. In such a case the overflowing waters are classified as "floodwaters," (530) and no liability attaches merely because there has been a re-routing of the drainage across a particular piece of land:

> It is well established as a general rule, subject to certain modifications herein noted, that the owner of lands through or along the border of which a natural watercourse flows may accumulate surface water falling upon lands adjacent thereto, and cast the same into such stream, without liability to a lower riparian owner for damages, although the flow of the waters is thereby accelerated and the volume increased provided that this is done in the reasonable use of his own land. (531)

Waste and Seepage Waters--According to Arizona Statutes "flood, waste or surplus water" is subject to appropriation and the procedures necessary to perfect such appropriation (496). Notwithstanding this statement of the law, one who uses wastewater flowing onto this land cannot establish a vested right thereto:

> It often happens that the prior appropriator, in irrigating the lower portions of his land, is compelled by the lay of the land to let the water run off from his property to the lands of others, in places where it is impossible to return the water to the natural stream. And it often happens that the water flows upon lands of those who are either not appropriators from the stream or are appropriators much later than others, who in point of time are entitled to the use of the water. This water is deemed by the courts to be waste water. And the question now arises: Can the owners of the lands on which it runs secure a permanent right therein to its continuous use? The authorities hold that while the water so denominated as waste water may be used after it escapes, no permanent right can be acquired to have the discharge kept up, either by appropriation, or a right by prescription, estoppel or acquiescence in its use while it is escaping, and that, too, even though expensive ditches or works were constructed for the purpose of utilizing such waste water, unless some other element enters into the condition of affairs, other than the mere use of water. In other words, the original appropriators have the right, and in fact it is their duty, to prevent, as far as possible, all waste of the water which they have appropriated, in order that others who are entitled thereto may receive the benefit thereof. (532)

The reasoning behind the exception to the general rule of appropriation of wastewater is that the original appropriators can destroy any rights in such water by either utilizing the diverted water more efficiently or ceasing the original appropriation altogether.

Salvaged and Developed Waters--These two distinct varieties of surface water are governed by the same rule in Arizona. Under that rule the individual who makes such water available is entitled to its use:

> Plaintiffs cannot rightly insist upon the continuance of a means that causes a waste of the waters not used by them at any time. Their rights are fully protected when water has been delivered to their lands at the advantageous point now used for that purpose in quantities equal to the amount they have appropriated to a beneficial purpose. The defendant may, if it feels inclined, employ means at its own expense to deliver said quantity of water to plaintiffs' boundary lines in its ditch there, and, if the means result in a saving of water that would otherwise be lost in the transportation by the means at present employed to deliver it to that point, such water so saved from loss would become as a right the property of the defendant. (533)

However, water which was once wasted in transportation or use by the original appropriator, but because of the employment of water conservation techniques by the same appropriator is now available for use, cannot be used on lands to which it was not originally appurtenant (534). The argument made in support of this conclusion is based on the principle of beneficial use. According to the general principle of law governing the nature of a water use, water beneficially used on a certain piece of land becomes appurtenant thereto and is not a private right held by the landowner. Moreover, since an appropriator is given a particular quantity of water for his use, he cannot subsequently increase that quantity without complying with the necessary statutory procedures.

In summary, a landowner in Arizona who is utilizing surface waters other than those that run in defined channels can effectively employ those waters in any way deemed necessary. Of course, this right is limited by the need to exercise care when collecting such waters for use so as not to loose them upon a lower adjoining landowner. Under Arizona law, diffused surface water belongs to the landowner upon whose land the water flows. Therefore, whatever use he makes of such water is clearly within his own discretion, limited only by the requirement of reasonableness.

Furthermore, since surface waters not confined to definite channels or bodies of water are not subject to appropriation and the statutory controls applicable to appropriable water, any use of such surface water cannot be limited by a prior existing vested right. A lower adjoining landowner has no cause of action against an adjoining landowner who utilizes all the available surface flow normally coursing from the higher land to the lower landowner's premises.

A use that requires an alteration in the normal course of surface water flow across the land may not so alter the existing drainage pattern so as to allow an abnormal quantity of water to flow over adjacent lands, causing injury to that property. If the alteration of the drainage pattern does not materially increase the volume of water normally traversing adjacent properties, then there will be no liability for the alteration, since there has been no harm. Moreover, in furtherance of a reasonable use of property, one can accumulate surface water and discharge it into an adjoining stream and not be liable to landowners on the lower part of the stream for damages done to their property as a result of the increase in speed and volume of the stream flow.

Since appropriative rights cannot be acquired in surface waters not confined to definite channels, pollution of such waters does not interfere with any right of another in the use thereof:

> [A] possessor's use of surface waters on his land that pollutes them so as to interfere with another's use of them on other land is ordinarily reasonable; the possessor is not subject to liability unless the primary purpose of his use is to harm the other.
>
> This rule is said to be a 'crystallization of the principle of reasonable use generally applicable to the use of land.' Defendant has an unqualified privilege to capture and use surface waters on his land, even though he impairs the use thereof on another's land; but, concomitantly, he cannot require another to permit surface waters to flow onto his lands. (535)

It is clear that if the surface runoff carrying the pollutants flow into a stream or lake, also polluting that body of water, the landowner using the surface water would be liable to appropriators on that stream or lake for damages resulting from his pollution. However, pollution of surface water that does not find its way to an appropriable water body may not be actionable, as no vested rights have been injured.

Implications for Land Application Systems--

The law of surface waters in Arizona is primarily concerned with the right of one landowner to control and utilize the flow of surface waters across his lands and those contiguous thereto. Although Arizona does not have the legal presumption that all surface waters are tributary to a stream, as does Colorado, it is still important that the operators of a land application system take note of the surrounding topography so as not to interfere with stream appropriators whose stream flow depends on local surface water runoff. Furthermore, steps must be taken to avoid excessive pollution of surface water flows in a situation where that flow is tributary to local streams, so as to avoid possible damage liability to local stream appropriators.

If precautions are taken to retain trace pollutants after application within the perimeter of the application site, surface waters such as precipitation will also necessarily be retained at the application site, and will not flow across adjoining lands as they had prior to institution of the land application system. This retention will more frequently be permissible in Arizona than in Colorado, because of the basic statement of Arizona law that diffused surface waters are not subject to appropriation. In addition, given Arizona's case law pertaining to pollution of surface waters, it is clear that there can be liability only where the pollutants flow into a natural watercourse and interfere with the use of that water by a person having a right to that water.

Given these basic principles, the recommendations made in Volume I of this report for land application systems as they relate to surface waters in appropriation theory states apply to Arizona. In addition, the following points are particularly applicable to Arizona.

1. While provisions for adequate buffer zones around application sites are generally useful to minimize the impact of surface waters on adjoining lands, the Arizona State Department of Health Services regulations emphasize the type of treatment that applied effluent must receive (536), but do not contain any buffer zone requirements. When combined with the relative lack of possible liability in Arizona for pollution that only affects surface waters, this means that provision of extensive buffer zones, while perhaps desirable, is not as necessary in Arizona as in some other states.

2. In operating the on-land application system, consideration will generally be given to retaining discharges within the system's perimeter. This is not as important a requirement in Arizona as it is in other states, since such retention is neither required by the Arizona State Department of Health Services regulations nor impelled by Arizona's surface water law. Retention is still desirable, however, in situations where there exists a nearby watercourse in which other landowners may have appropriative rights.

## Law of Groundwater

### Description--

Arizona has defined groundwater as "...water under the surface of the earth regardless of the geologic structure in which it is standing or moving. It does not include water flowing in underground streams with ascertainable beds and banks" (537). All other groundwater is presumed to be percolating and, therefore, not subject to appropriation, since percolating water is not part of the statutory classification of appropriable water types. Consequently, the burden of proof is on the individual seeking to establish that the water is running in an underground channel (538). If it is established that the water indeed is part of an underground stream, then the prospective appropriator must comply with the requisite statutory procedures governing the appropriation of water.

Percolating groundwater is subject to ownership, appropriation (539), or to statutory regulation, unless such water is part of what is termed a "critical groundwater area" (540). The Arizona State Land Department is responsible for designating critical groundwater areas, either on its own initiative or by petition from "...not less than twenty-five users, or one-fourth of the users of groundwater within the exterior boundaries of the groundwater basin or subdivision within which the lands proposed to be included in the critical groundwater area are located, whichever is the lesser number" (541).

One seeking to sink a well in a critical groundwater area for the purpose of drawing water for irrigation, must comply with section 45-313 of the Arizona Statutes, which specifies the requirements of the application for a permit (542). Any well which was commenced prior to the time the area in which the well is located was designated a critical groundwater area, can be completed without procuring a permit. However, the case law requires a signifcant commencement of construction before the area is designated, and if the court or land department finds the commencement insignificant, the well owner will have to comply with the statutory permit procedures (543).

The Arizona State Land Department cannot issue a permit for the construction of an irrigation well within any critical groundwater area for the irrigation of lands if, on the date the area was declared critical, those lands were not irrigated, or had not been cultivated within the five previous years. Also, a permit will be issued only to landowners upon whose property the well is to be located.

In general, Arizona applies the American rule of reasonable use to percolating waters; that is, the percolating water beneath the surface belongs to the landowner thereof, and he can use such water, even to the harm of his neighbor, provided he uses that water for a beneficial use upon the land from which it is drawn (544). A property owner seeking to maintain a successful action against another under the rule of reasonable use must show an actual present harm to his groundwater supply, and that the alleged wrongdoer's use of the extracted groundwater is not made on the land from which it was drawn.

According to the statutory regulations controlling the use of groundwaters, an individual or corporate water user is prohibited from transporting or using groundwater outside of a groundwater basin (545). This limitation is strictly construed when the land in question has been labeled a "critical groundwater area."

The thrust of Arizona's water law in this area has been indicated by the state's supreme court in *Jarvis v. State Land Department* (546). In that case, the petitioners were seeking to have the City of Tucson enjoined from transporting water from wells sunk into the Marana Critical Groundwater Area to lands both within and allegedly without the critical water area. The supreme court held that the City of Tucson could continue to pump water to those lands that were within the water basin from which the municipality was drawing, but the city was also ordered to discontinue pumping water to those areas outside of the water basin. However, the court provided an alternative to the City of Tucson, by which that city could supply the outlying areas:

> Finally, petitioners request this Court to determine whether Tucson by acquiring lands in cultivation in the Avra-Altar Valleys may remove the ground water used upon those lands to other areas contrary to the doctrine of reasonable use....
>
> We think, however, that the problem is critical to municipalities in Arizona and so justified our consideration even though not strictly embraced within the limits of the issues of the original lawsuit....
>
> ...Hence, we hold that the decree in this case will be modified if Tucson purchases or acquires the title to lands within the Avra-Altar Valleys which are now cultivated and uses the water which would have been used in cultivating such lands as a source of supply for its municipal customers. Tucson may withdraw an amount equal to the annual historical maximum use upon the lands so acquired. (547)

On the basis of the *Jarvis* decision it becomes evident that the rule of reasonable use can be bypassed if the need is great enough and the public interest supports the modification. However, it is clear that a plaintiff, seeking damages against a groundwater user, must show that his groundwater source has been actually and presently injured, and that the defendant utilized the water drawn from the ground outside the water basin or on different land than that from which it was originally taken. In respect to the impact of the *Jarvis* decision:

> That a water basin's aquifer is being mined, and that a critical groundwater area has been declared within the basin are 'facts and circumstances' made 'pertinent to the issue' of damage.... That percolating water is being transported out of the geographical confines of the water basin is a fact made pertinent to the issue of reasonableness.... These facts are to be weighed with other facts and circumstances such as quantity, use, contiguity of land ownership, and distance transported. (548)

Private ownership of percolating groundwater poses some difficulties when the use of such water causes pollution, either of the percolating water or another water source. It is clear that if a landowner taps into an underground channel, which is a water type subject to appropriation, and utilizes the water so as to pollute the source, he is liable for the injury caused thereby to other appropriators of the underground stream. However, it is not clear whether or not a user of percolating water will be liable for polluting that water and affecting others' use.

The general rule throughout those states recognizing some variation of private ownership of percolating water is that a defendant will be liable for an intentional interference and pollution of a plaintiff's use of percolating water (549). If the pollution is not intentional the defendant is still liable for injury resulting from his activity based on trespass onto the plaintiff's land, regardless of the water rights law controlling in the particular jurisdiction.

In Arizona, which follows the reasonable use variation of the rule of private ownership of percolating waters, it is unclear what legal ramifications stem from an unintentional pollution of these groundwaters. The reasonable use limitation requires only that the water be put to a beneficial use in relation to the land; there is no requirement that overlying landowners must share percolating waters.

If the underground water that is polluted is an underground stream, then there will be liability for the damages resulting to other appropriators who are tapping that stream and can prove that they have been injured by the pollution. If it is percolating water that is polluted, then a cause of action may lie in trespass, although Arizona's general use of "reasonable use" analysis in this area would probably limit any possible relief to money damages only. Finally, although there is no law specifically in point in Arizona, pollution of percolating waters in a critical groundwater area will not only be actionable, but may be more likely to produce injunctive relief, since the designation itself connotes a serious water problem that could not be cured by merely awarding money damages to injured persons.

### Implications for Land Application Systems--

Arizona is one of a minority of Western States that does not apply its appropriation doctrine to all underground waters. Since Arizona distinguishes between percolating waters, which are not subject to appropriation, and water in underground streams, which are appropriable, the legal implications will vary with the type of groundwater. Issues involving underground streams will be resolved in a manner comparable to their resolution under the natural watercourse legal structure in Arizona. Issues involving percolating waters, on the other hand, will be resolved in a similar manner as such issues are resolved in riparian states. Arizona groundwater law does not distinguish between the different types of land application systems. In connection with any of the major types of land application systems, the precautions outlined in Volume I of this report to minimize possible liability for interference with groundwater in appropriation states can be taken in Arizona.

## Summary

The Arizona State Department of Health Services has regulations governing the use of reclaimed wastes. Basically, these regulations cover only the level of treatment to be applied to the wastes before application, and do not otherwise limit the uses to which effluent may be put, the practices of the typical land application system, or the locations in which land application systems may be operated. The regulations prohibit the direct reuse of wastes originally containing human or animal wastes and require differing levels of treatment, depending on the use made of the wastes (536).

If the proposed use is: (1) irrigation of fibrous or forage crops not intended for human consumption, (2) irrigation of orchard crops by methods that do not result in direct application of water to fruit or foliage, or (3) watering of farm animals other than producing dairy animals, then the wastes must receive a minimum of secondary treatment (550). If, on the other hand, the purpose is: (1) irrigation of food crops subject to later processing that will destroy pathogenic organisms, (2) irrigation of golf courses or cemeteries, (3) watering of producing dairy animals, or (4) to provide water supply for impoundments used for only secondary contact recreation, then secondary treatment plus disinfection is required (551). Finally, if the purpose is to: (1) provide water supply for impoundments used for primary contact recreation, (2) irrigate school grounds, playgrounds, lawns or parks, or (3) irrigate food crops that can be consumed raw, then secondary treatment followed by tertiary treatment and disinfection is required (552).

In no case does compliance with these regulations eliminate the need to comply with Arizona water quality standards or the general water law of Arizona. The existence of these regulations, however, is indicative of a favorable orientation toward the possibilities of land application of waste. Unlike a state where the lack of any regulation requires one to guess what the administrative attitude toward land application would be, in Arizona that attitude is clearly favorable. Moreover, once the prescribed treatment and disinfection standards are met, Arizona does not specifically regulate many of the facets of a land application system, such as location of spray sites, buffer zones, frequency of spraying, and so forth. Instead, it is the result which is important--for example, prevention of harmful fecal coliform density.

When this favorable administrative orientation is coupled with a reasonably favorable basic water law, it is clear that the operation of land application systems will be feasible in Arizona and should be encouraged.

## CALIFORNIA

### Law of Natural Watercourses

Description--

California, unlike most other Western States, has developed an extensive statutory and administrative framework directed at the establishment and operation of land application sites for waste disposal. Despite these regulations, however, the general law of water and its uses must still be discussed.

Unlike Colorado, California is one of nine Western States that acknowledges a hybrid riparian-appropriation system of water rights, generally referred to as the "California Doctrine." The development of such a dual system in California has a long history. California originally recognized only riparian rights as part of the common law adopted by the state in 1850. Even after recognizing the doctrine of appropriation, riparian rights were still considered to be the superior interest. However, in 1928 a constitutional amendment was adopted which restricted both riparian interests and appropriation rights to reasonable beneficial use under reasonable methods of diversion and use (553). This doctrine of "reasonable beneficial use" is applied in the settlement of all claims based on conflicts in the use and diversion of water in California (554).

California water law recognizes water as a part of the land, and therefore, as real property (555). The right, however, is usufructuary--that is, a right to *use* water instead of dominion over water. Consequently, rights to water are protected only as to use and not to claimed ownership of the water in question (556).

The California definition of a "natural watercourse" follows the majority of other Western States in that the only elements necessary in order for a particular body of water to qualify as a watercourse are that it have a definite waterflow, bed, banks, and channel (557). The strength of the water flow may affect the value of the rights therein, but intermittent flow, frequent changes in waterflow or length of time of existence do not significantly affect rights to water use (558). Waters which overflow the stream banks because of flood or other sources, but which do not separate from the stream, are still considered part of the watercourse. It appears that in order for stream waters that were formerly part of a watercourse to qualify as flood waters, and no longer be part of a particular stream, they must become permanently separated from that stream (559).

Although California follows a hybrid, riparian-appropriation system of water rights, it must be emphasized that riparian rights no longer dominate California water law. Although the riparian interest is still considered a valuable property right, the influence of the appropriation doctrine and the extremes in the types of water environments found in California have effectively limited its scope.

California riparians have a right to flow of the water, but only in respect to a reasonable beneficial use thereof (560). Therefore, riparians are restricted by reasonable uses made of the water by upstream riparians. As was mentioned earlier, the "reasonable beneficial use" doctrine circumscribes a riparian's right to waterflow without diminution. Every riparian landowner has an equal right in the water as it passes his land, and consequently a riparian's interest in water contiguous to his land is common and reciprocal with all other riparians on the watercourse. Unlike the holder of an appropriative right, the riparian has no right in a specific quantity or "duty" of water. It is clear, then, that the riparian right cannot be analyzed in isolation from other interests in the same stream.

The strongest single factor limiting the riparian right is the test of reasonableness of the use. The test of reasonableness is not precise, but dependent upon a case by case determination based on a multiplicity of environmental, topographical, and economic factors (561).

Certain riparian purposes are recognized as *prima facie* useful and beneficial, including irrigation and domestic uses. Beyond those uses, the categorization is very imprecise. In general, the rule of reasonable use includes ordinary, economical, and beneficial uses (562). However, if a use has been determined as unreasonable, there is no priority in that use (563).

As to the relation between riparians on the same stream, the guidelines established by the California courts is that an upper riparian first using the water cannot, in general, use the flow to damage a lower riparian. If, however, the upper riparian's use has been found to be reasonable and beneficial, and the quantity he needs adversely affects the lower riparians' needs, the lower riparians may be required to tap the subsurface rather than the surface flow of the stream to satisfy their water requirement. In some circumstances, particularly in instances where either a very small stream is involved or there is only one riparian on the body of water, a riparian may obtain the right to the full flow of the water (564). These situations, however, arise very rarely.

A lower riparian has a cause of action for nuisance against an upper riparian who pollutes the water source so as to make it useless for ordinary domestic or irrigation purposes (554). Remedies available to lower riparians include money damages, an injunction, or a combination of both.

Riparian owners cannot establish priority in water use by becoming the first water user on a particular stream. This is because the riparian right is not based on actual use of the water but on the land's proximity to a water source. Thus, it has been held in California that even prospective riparian interests are protected (565). Despite this holding, however, certain riparian interest may enjoy a preference over others. During times of water scarcity in certain regions of California, a system of apportioning water among riparians comes into play. The factors determining the quantity of water to be apportioned to each use include the number of users on the stream, the volume of available water, the use and possible uses of each tract of land involved, the economic impact on certain uses, and the nature of the particular uses involved (566).

In addition to the foregoing principles, California has a system of priorities established for competing riparian uses which are not based on the appropriative right's "first in time, first in right" rule, but are based on the nature of the particular use. The first level of preference is that all "natural" uses, such as domestic uses, have preference over all "artificial" uses. It has been held by the California courts that the quantity of water that may be used for domestic purposes is unlimited even to the point that a lower riparian may be completely denied water, if the lower riparian's use is not also domestic (567).

Next in the preferential hierarchy is the use of water for irrigation (568). Such use of the water is limited only by the concept of reasonableness and the rights of other riparians utilizing the water in the same manner, or by others using the water for domestic purposes. Other artificial uses of water include storage, generation of electrical power, and recreation (569). These uses are limited in the quantity of water that can be drawn for use; that is, only a reasonable share of the water flow can be put to any particular artificial use.

The theory of riparian rights has been modified to suit conditions in California. The major modification of the theory was made by the constitutional amendment of 1928 (570). This amendment states the California policy of maximizing the beneficial use applicable between riparians and appropriators. The effect is to subject all water in excess of reasonable, beneficial riparian use to appropriation. The California Supreme Court acknowledged this change in 1933 by refusing to enjoin the appropriation of water which was not being put to reasonable beneficial use by the riparian owner (571).

Unlike the riparian right, the appropriative right is dependent on diversion and use of water and not on whether or not a particular piece of land is contiguous to a flow of water. The doctrine of "first in time, first in right" is limited to the actual use of water and does not include, as in the case of the riparian right, the potential or prospective use. In this regard, the appropriative right is limited to a specific quantity of water put to a beneficial use.

Included in the idea of utilizing a specific quantity of water is the appropriator's right to receive that quantity in a reasonable state of purity. This rule effectively limits a lower appropriator's opportunity to hold an upper appropriator who is polluting the stream liable for damages. Courts have ruled that some deterioration of water quality is inevitable when that water is put to reasonable beneficial uses and, therefore, if the pollution is within reasonable limits it is not actionable (572).

Although the place of use of the water diverted is part of the appropriative right, it is not determinative of the extent and nature of the right itself. Consequently, appropriative rights may be had which allow a water user to divert outside the watershed of the stream. Obviously, diversions which remove water from the watershed are limited by prior rights established on the same stream.

Appropriative rights, like riparian rights, are governed by the concept of reasonable and beneficial use (573). Uses which have been recognized as beneficial and reasonable for purposes of appropriation include irrigation for agricultural purposes (574), mining (575), domestic use (576), and power, municipal, industrial, and recreational uses (577). Moreover, the types of water available for appropriation correspond to the types available to the riparian interest, including water flowing in a stream or any natural channel, lake water, flood waters, underground waters in definite channels, springs, and waste and seepage waters.

Although the appropriative right is not dependent upon ownership of land contiguous to water, ownership of the land is relevant when determining the reasonableness of the use for which the water is being diverted (578). But, an appropriator can acquire rights to water even though he does not own the land upon which the water will be put to use (579).

The acquisition of an appropriative right is contingent upon compliance with specified statutory procedures. The steps outlined in the California

Water Code (580) are the exclusive way of obtaining and perfecting new appropriative rights (581). The California Statutes and administrative regulations state that in all steps involved with obtaining an appropriative right, the prospective appropriator must proceed with "diligence" (582). The concept of "diligence" is a question for the trier of fact, which includes considering the surrounding circumstances involved in the particular claim (583).

The California State Water Resources Control Board makes all determinations concerning the issuance of permits for diversion works (584). The board conducts hearings and investigations to determine whether or not a permit should be issued, and also serves as an overseer to prevent unauthorized diversions (585). All decisions of the board are subject to judicial review (586).

Water can be appropriated by anyone, including persons, corporations, or business trusts. A riparian may even appropriate or increase his present water use through appropriation (587). While a prospective appropriator has an application pending for appropriation, he can divert water for the use for which he is seeking the permit (588). The right, however, is protected only for a reasonable time--so long as the appropriator is proceeding with diligence on the construction of his diversion works (589).

As with other jurisdictions accepting the appropriation doctrine either entirely or in combination with the riparian doctrine, California applies certain basic appropriation principles.

The right to appropriate water entitles the individual to appropriate a specific quantity, and only that quantity actually used. The specific quantity of water given to the appropriator by permit is given for only a specific time; that is, the appropriative right only attaches at the time the water is used and as long as it is used. In addition, an appropriator is entitled to the certain flow of water in a reasonable state of purity (590). The concept of reasonableness here allows for a certain degree of water quality deterioration without making the cause of that deterioration actionable under the law.

Appropriated water can be diverted to outside the watershed. This right, of course, is subject to the limitation that such a diversion does not affect superior rights in the same water (591).

Appropriative water rights cannot vest unless the specific quantity of water is put to a beneficial use. California has placed the highest preference on domestic uses (592), with other specifically recognized beneficial appropriations including irrigation (593), milling, mining, and stock watering (594).

California law allows for changes in both the type and place of a beneficial use without disturbing the priority of an appropriative right. This, of course, is subject to the limitation that no increase in water quantity is required. Also, if the new use adversely affects water quality, the use may be labeled nonbeneficial and, consequently, not allowed.

It is clear from the foregoing analysis of both the riparian and appropriation doctrines as interpreted by the California courts, that there are not major variations from typical riparian and appropriation patterns. The important question, then, is how do these doctrines work together in the California law? Both riparian and appropriative rights "...exist simultaneously, and in many places they are in conflict. The conflicts between the doctrines and their adjustment have occupied a large part of the attention of the courts throughout the history of the State" (595).

The riparian right in California, as far as private land is concerned, is superior to later appropriative rights (596). This is because the riparian right is dependent on land location and not on actual use of water. Appropriative rights can only be acquired by adhering to permit requirements outlined in the California law, while riparians' rights, in contrast, vest in the land itself. However, this superiority given to the riparian right is not as extensive as it first appears. The 1928 California constitutional amendment (570) which promoted the concept of "reasonable beneficial use" now controls and circumscribes both riparian and appropriative rights. Thus, what is a beneficial use at one time may, because of changed conditions, become a waste of water at a later time (597).

In addition, a riparian, unlike an appropriator, is entitled only to a proportional share in the waterflow of a particular stream. There are no correlative rights between a riparian and a person gaining title by appropriation; the latter's rights will be absolute:

> The long-standing riparian doctrine has been modified and a riparian, as against an appropriator whose right has not ripened into a right by prescription, is not entitled to the full flow of the stream as it is wont to flow in a state of nature, without diminution by the appropriator, and his rights are limited by the doctrine of reasonable ues. (598)

In a dual-system state, such as California, the concept of preference contains essentially the same meaning as it does in appropriation jurisdictions, although there is more of a tendency to confuse "preference" with "priority." A use listed as the highest use generally complies with the meaning attached to "preference." In California the "highest use" of water is for domestic purposes, followed by irrigation, the next highest use. In respect to appropriation rights, this preference guides the granting of licenses to appropriate water. In the case of riparian rights a similar preference relationship between types of uses is implied in the distinctions between "natural" and "artificial" uses.

To summarize the relationship of appropriation rights and riparian rights in natural watercourses, it can be safely stated that although California recognizes the riparian interest in theory, California leans more to the prior appropriation doctrine. As to conflicting claims in the same waterflow, the final disposition of those claims is determined on a case by case basis. Consequently, the major concern of a land application system will be the securing of appropriation rights by complying with the requisite statutory procedures, since according to California law all water belongs to the public and is subject to appropriation.

### Implications for Land Application Systems--

Unlike numerous other states that have not classified land application systems, California has classified such systems according to geologic and hydrologic features of the disposal area and the capability for protection of surface and ground water quality (599). Despite the categorization of land application sites and the types of waste disposed of therein, certain basic effects will be experienced in many cases.

1. The system, by collecting wastes which may previously have been discharged into natural watercourses, will alter the pattern of flow of the body of water into which the wastes would have been discharged in the absence of the land application system. Basically, the system's institution will improve the quality of the water but decrease the flow beneath the previous point of discharge.

2. After the wastes are collected, treated, and applied for irrigation purposes, trace contaminants may remain which then drain into a natural watercourse, either the original watercourse from which the wastes were diverted or a different body of water.

In the first instance, it is clear that the law of prior appropriation would be applied. In other words, any diversion that is involved in the operation of waste site would have to meet the statutory requirements. The diversion itself will be subject to many limitations. First is the requirement of a reasonable and beneficial use. This will be easily met since California recognizes irrigation as reasonable *per se*. However, what may interfere with the securing of a permit to divert water from a watercourse is the "duty" of water needed to successfully implement the on-land application system. If the system diverts water from a stream which has only artificial uses diverting water from its flow, then the irrigation use will have preference and will be given its full duty of water. Notwithstanding the preferential character of irrigation, however, any depletion in the duty of other appropriations on the stream will have to be compensated. To summarize, with regard to the possible effects of an application system on a watercourse, the following implications apply to California law.

1. Since the majority of natural watercourses in the state already have existing appropriative activity, a diversion system for land application on a particular watercourse will be subject to water quantity limitation imposed by the mere fact of the pre-existing water use right.

2. Moreover, even though the land application system, as "irrigation," will have preference over all other uses except domestic uses, the concept of priority will impose limitations on water quantity, since compensation will have to be made to pre-existing uses if the land application use affects the ability of those uses to appropriate their necessary amounts of water. However, because of preferred status of irrigation, even if the land application

diversion is junior to another use and if that pre-existing use has a lower preference, the land application system cannot be deprived of its full requirements of water without compensation.

The second way in which the law of natural watercourses may intersect with land application systems occurs if, after application, trace contaminants remain on the land and are eventually washed into a natural watercourse. If, in a particular situation, some contaminants drain into a natural watercourse, then the following consequences may ensue. It is clear that there can be liability in California for the pollution of the waters of a natural watercourse. A riparian has a basic right to unpolluted water, although another riparian may impair the quality of the watercourse to some degree if such action is not malicious or unnecessary. The basic cause of action is for nuisance, and the injured riparian may receive money damages or an injunction.

In the case of appropriative rights, California law provides that the appropriator has a right to a reasonable state of purity of the water reaching his diversion works. As in the case of the riparian right, some deterioration of the water is allowed, provided it is within reasonable limits. Consequently, although there is allowable pollution, it is evident that even a reasonable and beneficial use can be held liable for pollution of the watercourse.

There is no way the system's operators can totally eliminate the possibility of liability for trace pollution of a natural watercourse. Even if all necessary operation permits under California law are secured, these permits do not shield the operator from possible liability. But there are several steps that can be taken to further minimize the possible risk. In addition to taking the precautions outlined in Volume I of this report pertaining to natural watercourses in appropriation states, strict adherence to the California regulations governing the creation and operation of waste disposal sites will provide the requisite foundation of reasonableness in any possible lawsuit.

## Law of Surface Waters

### Description--

California does not possess extensive statutory or case law in regard to diffused surface waters and the rights therein. The right of a landowner to use such water has been of less concern to the courts than the right to channel and drain the water onto another's land.

Surface waters are the uncollected flow from falling rain or melting snow diffused over the surface of the land and are distinguishable from natural watercourses such as rivers or lakes. They continue to be diffused surface waters until they flow into a natural watercourse or percolate through the ground.

Regardless of the method used to apply wastewater to the land, potential liability could arise from increased surface water runoff onto adjacent land; from the deposit of contaminants onto adjacent lands; from the impoundment of surface water on the application site; or from obstructing the flow of surface water from adjacent land onto the application site.

Until 1966, California traditionally followed the civil law rule which recognized a servitude of natural drainage between adjoining lands and imposed liability for interference with the drainage (600). The rule declared that the landowner had a duty to receive surface waters from above his land and had a corresponding right to have the water flow from his property to the land below (601). The 1966 decision of *Keys v. Romley* (602), however, added to the civil law rule a doctrine of reasonable use. Under the modified rule, the landowner apparently is not liable for damages caused by his alteration of surface water drainage if he uses reasonable care and prudence in so doing (603). This modified rule of reasonable use thus would be the standard by which the following potential areas of liability would be judged.

By saturating the soil with wastewater, a land application system potentially could cause excessive surface water runoff onto adjacent land. Secondly, this runoff could carry contaminants onto the neighboring property. Both situations could subject the operator of an application site to liability.

With respect to the creation of excessive surface water runoff, it is well settled that one who causes surface waters to flow onto lower lands with increased volume or velocity will be liable to the lower landowner for interference with surface water drainage rights (604). An exception to this rule is a change in drainage caused by tilling fields in the natural manner; however, an application system would not come within this exception (605). Alteration of the natural drainage pattern caused by a land application system and the resulting increased surface water runoff could possibly be unreasonable under both the traditional civil law rule and under the *Keys* (602) standard unless reasonable steps are taken to create ditches and drainways in accordance with accepted irrigation practice. Although increased surface water drainage resulting from conventional agricultural irrigation is expected and tolerated within reasonable limits, wastewater irrigation may undergo stricter scrutiny by the courts. Whereas conventional irrigation is considered a reasonable beneficial use under the California Water Code, wastewater irrigation enjoys no such favored status. Thus, the courts may find that the operator of a wastewater application site must take reasonable precautions to avoid causing injury to adjacent property due to an altered drainage pattern. It should be noted that since wastewater irrigation is subject to control by the regional water quality boards (606), the operator of an application site could be ordered to abate any unreasonable condition of drainage that causes injury to his neighbor.

Secondly, the discharge of water and the deposit of contaminants upon adjacent land may be actionable under theories of trespass (607), nuisance (608), inverse condemnation (609), and possibly for pollution of surface water. With regard to an action for trespass it must be noted that when contaminants are deposited on the land of another, water rights probably are irrelevant since the plaintiff is being deprived of the use of his land, not the use of his water (610). Liability for nuisance may rest upon an intentional invasion of the plaintiff's interests, a negligent invasion, or conduct which is ultrahazardous and thus falls within the principle of strict liability. In order to recover for a private nuisance, the injured party must establish both substantial and unreasonable interference with the interest involved and that his damages are different in kind or degree from those of the general public (611). In on-land application systems, the injured party probably would have to establish that the wastewater contaminants were harmful to his crops or rendered his land unfit for use. The mere deposit of contaminants, without more, probably would not be actionable. Where a public entity discharges large quantities of water on a landowner without his consent, the principles of inverse condemnation come into play and the landowner has a cause of action for damages independent of the taking of the property (612).

In order to avoid potential liability to adjacent landowers for unchecked runoff of surface waters, it would be advisable to use interceptor ditches to collect both contaminated surface water and excess wastewater and either recycle the water into the land application system or discharge the water into a natural watercourse. These alternatives may create several additional areas of concern. First, the impoundment of diffused surface water on the application site seems to be lawful as long as natural watercourses likewise are not detained. Diffused surface water generally may be captured by the owner of the land over which it moves, and when captured, becomes the property of the landowner (613). California courts have upheld the impoundment of surface water even though such impoundment has deprived the lower landowners the customary flow of surface water (614). Thus, a system of intercepting and recycling excess waters on the application site probably would be lawful. A second concern will be raised by the discharge of this excess water into a natural watercourse. Such a discharge would require a permit under the National Pollution Discharge Elimination System (NPDES) (279). A final concern will be raised by the attempt to repel surface water naturally flowing onto the application site. Conceivably, obstruction of surface water flowing onto the site from upper lands may be necessary for the proper functioning of the wastewater system. If the operator of the application site is a private person, he has no right to obstruct the flow of surface water that naturally drains across his property from adjoining lands (615). A government operator, however, apparently may validly exercise the police power to obstruct the flow of diffused surface water onto the site without making compensation for any resulting damage (616).

### Implications for Land Application Systems--

The California law pertaining to diffused surface waters deals almost exclusively with the issue of an upper landowner creating a discharge that did not previously exist, altering an existing waterflow so as to adversely affect the lower landowner, or the lower landowner affecting the natural surface water flow so that the upper landowner is damaged thereby. One thing is clear from the direction these cases appear to be taking and that is California courts will likely apply the rule of "reasonable use" to questions concerning altered flow and pollution. Consequently, pollution for no valid purpose might be unlawful, but trace pollution in connection with an otherwise reasonable use might be lawful.

According to California law, land application sites are probably a reasonable and beneficial use of water. It is therefore unlikely that such a site would be prevented from operating because of trace pollution of surface waters. In the case of trace pollutants escaping the application site with surface waters, the system operators might have to pay for damages caused to adjoining landowners, but the possibility of such liability is even less likely in the surface water category than it is in the natural watercourse category. The reason for this is because the potential claimants for harm to surface waters are almost always limited to the immediately adjoining landowners, rather than including all downstream owners as in the natural watercourse category, and since less gainful use is generally made of surface waters, it is much more difficult for a claimant to prove the loss of a specific use and consequently, a decline in the market value of his land.

Although an upper property owner may have a vested interest in maintaining the natural flow of diffused surface waters, it is unclear in California whether a lower landowner has the same vested interest in maintaining the flow to his land. However, since it is clear that one cannot establish riparian rights in diffuse surface waters, nor, for that matter, does it appear that one can appropriate such waters, it is unlikely that a land application system would be liable for interference with the flow of diffused surface waters. The upper landowner--in this case, the land application system--can with probable impunity collect all surface water on its property and thereby solve its problems of possible trace runoff. The recommendations contained in Volume I of this report regarding surface waters in appropriation states would apply to land application systems as they relate to surface waters in California.

## Law of Groundwater

Description--

California water law recognizes three basic types of groundwater: (1) the underflow of a surface stream; (2) a definite underground stream; and (3) percolating waters. Underground waters flowing in definite channels and the underflow of surface streams are treated the same under the California law--both are treated as natural watercourses. Percolating waters, however, receive some unique treatment.

The underflow of a surface stream is that water permeating the soil, sand, and gravel that is the bed of that surface stream. It is essential, according to California precedent, that the surface and subsurface waters of a stream be in contact with each other, and that both flows have the same general direction. Therefore, if the groundwater in question does not satisfy the aforementioned criteria, it cannot be considered the subsurface flow of a surface stream (617). The law is "...well established that the underground and surface portions of the stream constitute one common supply" (618). Consequently, the law governing watercourses in general also applies to the subterranean part of the stream, and moreover, the rights that are recognized as attaching to the surface flow, also attach to the underflow. Thus, one can become a legal appropriator of subsurface flow, provided that the statutory permit requirements are satisfied. In regard to the riparian right and its relationship to the use of the underflow of a stream, it is also the law in California that the riparian right attaches equally to the underflow and surface flow of a stream.

The definite underground watercourse, like the underflow of a surface stream, is governed by the laws pertaining to water use on natural watercourses. The terms "defined" and "known," describing a particular subterranean watercourse, refer to the same characteristics necessary in order for a surface waterflow to be considered a natural watercourse. That is, there must be a channel with definite boundary (defined) and there must be knowledge from "reasonable inference" of the course the particular underground stream takes. All underground watercourses are subject to both appropriative and riparian rights.

California law presumes that groundwater is percolating and, therefore, not a part of a stream nor part of an underground channel (619). California statutory law does not include percolating water within its provisions for the appropriation of water or the adjudication of rights in water; consequently, percolating waters are not subject to these statutory provisions.

Included in the term "percolating water" are subterranean basins filled with loosely packed water-bearing materials--waters which have left a surface stream and have lost their character as part of the flow and are not part of an underground channel, and, of course, waters which are broadly diffused through the soil strata.

Rights in percolating water are real property rights, that is, the right to take water from the ground underneath one's land is based on ownership of the land and is appurtenant thereto (620). However, this "overlying right" is subject to the "correlative rights" doctrine, which requires that the respective overlying owners put the water to a reasonable beneficial use, and provides that no overlying owner has a greater right in the underground water than any other landowner using the same water. If there should be an insufficient amount of water for all, then the water may be apportioned among the users. Moreover, until actually taken into possession, percolating waters are not owned by each private owner of overlying land, but by all owners in common.

The correlative right doctrine does not allow for a priority relationship among users. Like the riparian right, the correlative right does not depend on use. Therefore, one cannot gain priority by first using the percolating water (621).

Despite the fact, however, that one cannot establish priority in the use of percolating waters, it is clear that certain uses have preference over others. For example, the rights of an overlying landowner to use percolating water on his own land are superior to a use on land some distance from the underground water source (622). This limitation does not extend to surplus percolating water; that is, the overlying landowner may take what he needs before any user upon distant lands will be allowed to divert a quantity of the percolating water, but then the appropriator for distant use may divert surplus percolating water.

The constitutional amendment of 1928, making the principles of reasonable beneficial use the controlling factor in the law of water use in California, also applies to the use of percolating water (570). This principle prohibits an overlying landowner from wasting the water he draws from the ground. In other words, the overlying landowner has a right only to that quantity of water actually needed.

Under California's correlative rights doctrine, each owner of land overlying a common groundwater supply has a right to the reasonable beneficial use of the water. Since the discharge of wastes is not a recognized, protected beneficial use, no overlying landowner has the right to contaminate groundwater supplies to the detriment of a neighboring user of water. Accordingly, if an application system unreasonably interferes with a beneficial right to use groundwater, such pollution could give rise to private actions for interference with water rights (whether appropriative or correlative) and public statutory actions to abate the condition.

A second groundwater problem may be caused by wastewater that seeps into the underlying water supply and elevates the water table. Such a condition could interfere with the surface water drainage of adjacent lands. Several California court decisions have imposed nuisance liability on defendants who have raised the water table and caused drainage problems on neighboring land. In *Shields v. Wondries* (623), for example, the court held that an owner of land may not conduct even non-negligent activities on his property when they create a nuisance as to his neighbor. Accordingly, the operator of an application site could be enjoined from maintaining the nuisance caused by the elevated water table or could be liable for damages.

Implications for Land Application Systems--

As was previously mentioned, California has established a classification system for on-land application sites (599). This classification system also includes classifying the various types of wastes that are allowed to be dumped on a particular land application site (624). These regulations will be discussed later. Among other things, the California Administrative Code establishes certain requirements pertaining to soil permeability, slope of the land, proximity to groundwater and tributary groundwater sources, depth to groundwater, rate of groundwater movement, the types of soil materials through which the groundwater travels and the annual precipitation in the area of the land application site (599). These factors must, of course, be considered and complied with before proceeding with the construction of any on-land application site.

Groundwater in definite underground streams or part of the subsurface flow of a natural watercourse, is governed by the same principles of law as is the natural watercourse. Therefore, to minimize the possibility of liability for adversely affecting other groundwater users on definite underground streams or subsurface flow, the same steps should be taken as would be taken for a surface stream.

California as a "correlative rights" state treats percolating waters very similar to the way it is treated in the Eastern States applying the reasonable use theory. In particular, California presumes that underground waters are percolating rather than tributary to a watercourse, which is consistent with typical eastern law and not with the law as applied by most other Western States. Since California possesses an extensive regulatory scheme aimed at controlling land application sites and waste disposal thereon, it is necessary only to repeat more general precautions that should be taken when dealing with underground water. A land application site may raise the possibility of polluting water sources in the vicinity surrounding the site itself, both above and below ground. To minimize the possibility of leakage into underground waters, causing trace contaminants to infiltrate these water sources and resulting in damage liability for the system, the precautions outlined in Volume I of this report pertaining to groundwaters for appropriation states should be taken into consideration and the California regulations followed. In particular, it should be noted that to avoid liability for raising the water table, the operator of the system should carefully monitor the percolation rate of the wastewater and should not use a groundwater recharging system, such as the rapid infiltration method, when the water table is customarily high. This is particularly important in California because of cases specifically holding that uses which raise the water table create liability on a nuisance theory. Monitoring is required by the California regulations pertaining to on-land application sites.

## Summary

Land application of wastewaters from community and industrial sources has been practiced successfully in California for many years, and by 1972, 248 municipal facilities were using land treatment as part of the waste treatment process (625). Any contemplated project initially must comply with the waste discharge requirements of the California Water Code (626) and the administrative regulations that establish procedures for the land application of wastewater (627). Generally, the Water Code requires that all discharges of wastes, which includes sewage and any and all other waste substances (628), other than into community sewer systems must file a report (629) with the Regional Water Quality Control Board, which has the authority to establish requirements for the proposed discharge of wastes (630).

California has several different sets of administrative regulations which apply, directly or indirectly, to land application systems. The most important is that of the State Water Resources Control Board, "Waste Disposal to Land," (627) which are more directly aimed at land *disposal* than at land *application*, also cover land application systems, at least insofar as they set certain standards for protection of underlying groundwater supplies. These regulations classify disposal sites into five categories and specify the types of wastes which may be discharged in each classification. For example, in Class I disposal sites, there must be no possibility of discharge of pollutant substances to usable waters. Usable groundwater may underlie the site only under extreme cases and where natural geological conditions prevent movement of the wastes to the water and provide protection for the active life of the site. When these stringent conditions are met, all specified waste groups may be received (631).

Class II-1 disposal sites, by way of contrast, may overlie or be adjacent to usable groundwater and artificial barriers may be used for both vertical and lateral waste confinement. Protection from a 100-year frequency flood must be provided. Under these condtions, Groups 2 and 3 wastes, but not Group 1 wastes, may be accepted (632). Group 1 wastes are toxic substances such as chemicals, acids, phenols or pesticides; Group 2 wastes are chemical or biologically decomposable materials; and Group 3 wastes are non-water soluble, nondecomposable inert solids (633).

Basically, California law is favorable to development of land application systems, as is evidenced by the number of such systems already in operation there. The regulations, although extensive and occasionally overlapping, are by and large clear, concise and reasonable. The underlying state water law is more favorable than that of any other Western State, as well as several Eastern States.

## COLORADO

### Law of Natural Watercourses

Description--

The doctrine of prior appropriation controls the water law of Colorado. When Colorado was admitted as a state in 1876, the constitutional committee, reasoning that the semi-arid environment of the state precluded any consideration of the riparian rights theory, codified this dictrine in the state constitution (634). This total rejection of riparian principles became known as the "Colorado Doctrine," and it is still the foundation of the water law of eight Western States--Arizona, Colorado, Idaho, Montana, Nevada, New Mexico, Utah, and Wyoming.

The definition of "natural watercourse" accepted by the Colorado courts is summarized in *In re German Ditch & Reservoir Co.:*

> A water-course consists of bed, banks, and water. Yet the water need not flow continually; there are many water-courses which are sometimes dry. To maintain the right to a water-course, it must be made to appear that the water usually flows in a certain direction, and by a regular channel, with banks and sides. (635)

The supreme court also noted that the state legislature, in using the words "tributary to a natural stream" in the state statutes, did not intend that the tributaries themselves must be natural continuous running streams, but that the tributaries included all sources of supply which go to make up the natural stream. This definition of "natural watercourse," including the very broad definition of tributaries, is common to most appropriation states; like most such states, Colorado has made only minor variations on the interpretation of the elements necessary to apply in finding a particular body of water a "natural watercourse."

Given this definition of a "natural watercourse," the first question is whether downstream prior appropriators of a watercourse from which wastes are diverted for on-land application will have a cause of action because of the diversion either of wastes or waters of the stream diverted along with the wastes.

The central theme of the prior appropriation doctrine, in Colorado as elsewhere, is "first in time, first in right" (636). In Colorado this theme is only slightly modified, in that considerations of preference in appropriations are also part of the statutory scheme. According to one authority:

> 'Preference' is a generic term, and a preferential right may have one of a number of different effects. It may give persons who use waters for some purposes a right to the water that is superior to prior rights for other purposes, or it may give certain water users a better right than others using the water for the same purposes. Some preferences permit a preferred user to condemn and pay for non-preferred water rights; others withdraw water from general appropriation and reserve it for future preferred uses; still others amount to rules for choosing between substantially simultaneous applications for permits to appropriate the same water. In addition, policies governing the actions of planning agencies may require that certain uses must be given preference over others in the formulation of projects for the development and use of water. (637)

Thus, priority refers to the chronological order of the acquisition of the right. Preference relates to the character or relative value of particular uses (638).

It must also be noted that the Colorado appropriation doctrine applies only to the waters of a watercourse, and not to any wastes previously added thereto. Hence there can be no liability for diversion of *wastes*. Possible liability for diversion of *water*, however, depends on the answer given to two subissues framed as questions. What is the priority relationship of the parties involved? Is a "preferred use" involved in the controversy? Priority in appropriation of water under Colorado law is not subject to permit requirements, in contrast to the situation that exists in a majority of the appropriation doctrine states (639). No particular filing is required to perfect an appropriation. What is required, however, for a valid appropriation is that the prospective appropriator make an actual diversion and apply the water to a beneficial use (640). If the diversion and the beneficial use of the water appropriated are accomplished, any subsequent filing or recording of such activity relates back to the inception of the appropriative activity. In the final analysis, the right to divert water for a beneficial purpose can never be denied and in the case of appropriation from a natural watercourse, there is no requirement for a permit.

It is clear from the Colorado law that, if an individual complainan can establish that he has the prior right to appropriate water from the stream in question, then whether or not he has a cause of action depends: (1) on whether the junior appropriator is diverting a quantity of water that diminishes the senior appropriator's legal "duty" (641); and (2) on whether any one of the parties has a better right as a result of diversion for a preferred use. Ignoring considerations of preference for the moment, Colorado law gives to a senior appropriator a cause of action for damages against a junior appropriator on the same stream who diverts such a quantity of water as to diminish the "duty" of the senior appropriator (642).

In the converse of the above situation, a junior appropriator may have a cause of action against a senior diversion that deprives the junior water user of his legally defined duty. Basically, the senior appropriator may satisfy his quantity requirements, even to a junior appropriator's loss in his legally authorized duty, but he may not appropriate water beyond his duty without compensation. This is the logical conclusion of the doctrine of "first in time, first in right."

The following statements summarize the possible priority relationships and the likely results of a controversy resolved solely in terms of priority.

1. A senior appropriator has a cause of action (right to compensation) for loss due to a junior appropriator's diversion of water from the stream upon which both diversions occur, if such junior appropriator diminishes the senior appropriator's lawful duty.

2. A senior appropriator will not have to compensate a subsequent appropriator despite the fact that in order to fill the senior's water quantity right, he lowers the stream flow sufficiently enough to deprive the junior appropriator of his duty. However, compensation will have to be made for an appropriation that goes beyond the senior's duty and, results in a loss of quantity at the diversion works of the junior water user.

3. Obviously, if the diversion of water from the stream does not in any way affect the amount that is needed by existing appropriations on that stream, then, of course, there has been no injury.

This summary involves only one aspect of the relationship among water users on the same natural watercourse, the concept of priority. If the concept of preference is also involved in a particular controversy, the outcome may be altered so as to be inconsistent with the "first in time, first in right" premise of the prior appropriation doctrine.

The Colorado Constitution establishes the following preference relationship between particular uses:

> [T]hose using the water for domestic purposes shall have the preference over those claiming for any other purpose, and those using the water for agricultural purposes shall have preference over those using the same for manufacturing purposes. (643)

Thus, if a downstream appropriator is diverting water under a preferred use, such as for domestic purposes, the competing diversion on the same stream is for the purpose of irrigation, then any injury caused to the domestic diversion as a result of the irrigation use must be compensated, regardless of the priority relationship between the parties involved (644). Furthermore, if the irrigation diversion has preference over the downstream appropriator (such as, irrigation vs. manufacturing use) and the downstream appropriator has priority, the irrigator, as the junior appropriator, would still have to compensate the senior appropriator for loss in the quantity of water the senior is authorized to draw from the stream. However, if the irrigator has *both* preference and priority over the downstream manufacturer, he need not compensate the junior appropriator unless by the diversion of the water he has exceeded his authorized quantity and by so doing cuts into and limits the opportunity of the junior appropriator to satisfy his needs.

A second question that must be considered in relation to natural watercourses is whether, if trace contaminants remaining after on-land application drain into a watercourse, a downstream prior appropriator of this watercourse would have a cause of action. The Colorado law on this question is similar to the law stated in riparian theory jurisdictions, in that the lower riparian owners have a right to receive water from the stream in its natural condition of purity, subject perhaps to reasonable use by the upper riparian owners. The Court of Appeals of Colorado, in the case of *Suffolk Gold Mining & Milling Co. v. San Miguel Consolidated Mining & Milling Co.* (645), stated that:

> ...we are quite of the opinion that the title and rights of the prior appropriating company were not absolute, but conditional, and they were obligated to so use the water that subsequent locators might, like lower riparian owners, receive the balance of the stream unpolluted, and fit for the uses to which they might desire to put it. This, of course, is subject to the condition that the circumstances and situation of the use and the application were such as to permit the preservation of the remaining volume of the stream in its original condition. We do not undertake to decide that, if the prior appropriator had put the property to a use under circumstances which rendered it impossible for him to enjoy it without some detriment to the unappropriated water, he might not have the right to thus use it. (646)

Under this statement of law, liability for pollution of a watercourse in Colorado is slightly more likely than in a reasonable use riparian jurisdiction, but less likely than in a natural flow riparian jurisdiction. Pollution of public stream waters has also been found by the Colorado courts to be equivalent to a taking of a property right, and therefore, compensation must be paid to the injured party (647).

Thus, on the basis of the foregoing precedent, it is certain that the landowner who allows contaminants from the on-land application of wastes to flow into a nearby stream will be held legally responsible to compensate those who have legally recognized rights to the waters of the stream and who can prove that they have been damaged by the defendant's pollution.

Implications for Land Application Systems--

Colorado law makes no provision for a preferred method of land application of wastes. The major concern of the law governing water use is that any proposed diversion must be made for a beneficial purpose. With regard to the possible effect of an application system on the quantity of flow of a watercourse, it is clear that the rules of "priority" and "preference" will have the following implications.

1. Since the vast majority of natural watercourses in Colorado already have existing appropriative activity, it is clear that a diversion system for land application on a particular watercourse will be subject to water quantity limitations imposed by the mere fact of the pre-existing water use right.

2. Moreover, even though the land application system will likely be considered irrigation and thus have preference over a majority of other uses (except domestic uses) the concept of priority will impose implied limitations on water quantity, since compensation will have to be made to pre-existing uses, if the land application use affects the duty of those uses. However, because of the preference status of irrigation, even if the land application diversion is junior to another use, if that pre-existing use has a lower preference, the land application diversion cannot be deprived of its full duty without being compensated therefor.

3. Any appropriation for waste purposes junior to any other appropriative right will be liable for compensation if the appropriator requires a quantity of water which will adversely affect the earlier right's duty.

4. Since the Colorado courts have found pollution of public streams to be equivalent to the taking of a property right, it is clear that any pollution caused by a waste system which causes harm to a downstream appropriator must be compensated regardless of the "priority" or "preference" relationship.

The second way in which the law of natural watercourses may intersect with land application systems occurs if, after application, trace contaminants remaining on the land are eventually washed into a natural watercourse. If, in a particular situation, some contaminants drain into a natural watercourse, then the following consequences may ensue. Since an appropriator's right to the use of the waters of a natural watercourse is not absolute, there can be liability for pollution of those waters. This liability also extends to stream waters to which the former stream is tributary. Money damages and injunctive relief are available to the injured parties, but it is unlikely that a "beneficial" use such as land application of wastes (irrigation) will be enjoined. However, money damages will be assessed for any proven injury. There is no way the system's operators can totally eliminate the possibility of liability for trace pollution of a natural watercourse, but the steps outlined in Volume I of this report concerned with natural watercourses in appropriation states can be taken to further minimize the possible risk.

## Law of Surface Waters

Description--

In Colorado a distinction must be made between "diffused" surface waters, which is water flowing across land surfaces caused by melting snow and rain, and other surface waters, such as waste and seepage flows.

Diffused Surface Water--A statement of the Colorado law governing the use and disposition of diffused surface waters is contained in the case of *Hankins v. Borland* (648), wherein the Colorado Supreme Court remarked:

> The modified civil law rule which has been adopted by Colorado has been summarized as follows: Natural drainage conditions may be altered by an upper proprietor provided the water is not sent down in manner or quantity to do more harm than formerly. (649)

Accordingly, the law gives to the upper landowner a legal, as well as a natural, easement for servitude over the property of the lower landowner for drainage of diffused surface water flowing in its natural course and manner. This easement allows the upper landowner to channel the flow of surface water onto lower contiguous lands if such action is taken with due care and does not extensively limit the lower landowner's use of his property:

> A natural water course may be used as a conduit or outlet for the drainage of lands, at least where the augmented flow will not tax the stream beyond its capacity and cause the flooding of adjacent lands.... '...one who attempts to gather water into a drain or to maintain a drain for his own convenience, is bound to take due care that no injury is done by it.' (650)

Moreover, it has been held that where an upper landowner uses a natural drainage pattern or stream as a conduit and that drainage pattern or stream traverses a lower landowner's property, and the upper landowner exercises due care and diligence so that no harm will result from the flow of diffused surface water into the conduit, the fact that unusually heavy rain fell and widened and deepened the watercourse will not subject the upper landowner to liability for damage to the lower landowner's property (651).

Colorado water law contains two very important limitations pertaining to the control and use of diffused surface waters by the landowner over whose property such waters flow. The first limitation is the presumption that all surface and groundwaters are tributary to some stream or stream system:

> The volume of these streams is made up of rains and snowfall on the surface ... which finds its way to the streams running through the watersheds in which it is found. (652)

Therefore, once such waters have been established as tributary to a stream, they cannot be interrupted in their course and diverted from the stream; they belong to the people of the state under the Colorado Constitution (653). This presumption, then, effectively narrows the definition of diffused surface waters to include only those waters not tributary to any stream, be it on the surface or under the ground.

Another and more obvious consequence of this presumption is the fact that the burden of proof is placed on the person seeking a decision that a particular flow of diffused surface water is not tributary to any stream system (654). The standard of proof is met only by "clear and satisfactory" evidence (655).

The second major limitation on the use of diffused surface waters is Colorado's Livestock Water Tank Act (656). This Act allows landowners to impound diffused surface water for use in watering cattle and other livestock, but it recognizes that there are pre-existing appropriative rights in watercourses to which such diffused surface waters may be tributary. If such is the case, then the opportunity to impound diffused surface waters tributary to a natural watercourse is limited by the existing vested appropriative rights.

If the diffused surface waters are found not to be part of a stream's system, the act establishes a hierarchy of priorities among those individuals seeking to use water for such tanks. This priority scheme is also based on the principle of "first in time, first in right," but certain prerequisites have to be satisfied as stipulated in the Colorado Statute:

> The state engineer's certificate of approval of a livestock water tank on each normally dry stream and its tributaries shall be chronologically numbered in the order of the completion thereof, and priority of right as between such tanks located on or within the watershed of each dry stream shall be determined by such numbers seriatim, number one being first in such right. The certificate of approval, specified in section 35-49-108, shall contain a certification of the priority of the use specified. (657)

Other Surface Waters--Surface waters other than diffused surface waters can be divided into two further categories--waste and seepage, and developed waters.

In the case of *Bieser v. Stoddard* (658), the Colorado Supreme Court defined developed waters as follows:

> Developed waters, strictly speaking, must be those waters which run to waste except for their discovery and development. (659)

This doctrine of developed waters applies only to that water augmenting the flow of a stream; it must be a new supply of water and not a mere hastening of the present flow in the stream. A person who thus augments the flow of a stream is entitled to the use of such water in a quantity equal to the increase in flow caused by the developed water:

> It is only the actual increase resulting from the addition of water to a natural stream which would not otherwise pass down either its surface or subterranean channel, to the benefit of other prior appropriators, which the law recognizes as an increase of that character which can be diverted as against those entitled to its natural flow. (660)

Water that has been removed from another watershed or subterranean channel, and released into a local watercourse is subject to use by the one importing the water, with the following restrictions:

> Whenever an appropriator has lawfully introduced foreign water into a stream system from an unconnected stream system, such appropriator may make a succession of uses of such water by exchange or otherwise to the extent that its volume can be distinguished from the volume of the streams into which it is introduced. Nothing in this section shall be construed to impair or diminish any water right which has become vested. (661)

Obviously, the removal of groundwater or surface water from any watershed for transport to another area outside the watershed is circumscribed by the previously mentioned considerations on the tributary character of such waters and the existing appropriative rights therein.

Seepage waters are waters seeping from the reservoir or other works of an appropriator (such as irrigation ditches), and which may enter existing stream channels or become part of some other surface water flow (662). Whenever seepage waters in their natural flow pattern enter a stream, they are part of the stream from the moment of their escape. Therefore, seepage waters escaping and flowing to a natural stream are subject to the hierarchy of appropriation priorities established on the particular stream. If, on the other hand, the seepage waters are found not to be part of a stream system, the landowner upon whose land such waters arise has the superior right to use those waters (663).

Wastewaters are those waters which are a product of purposeful drainage from project works, ditches, or runoff from irrigation systems (664). The same considerations concerning the destiny of the flow applicable to seepage waters are also applied to wastewaters. Consonant with these considerations is the principle that: "Waste waters which are again returned either to the main stream [from which diverted] or its tributaries, become a part of the waters of the stream the same as though never diverted, and inure to the benefit of appropriators in the order of their appropriations..." (665). Insofar as the wastewater is not tributary to a stream system, it is subject to appropriation; but, if one appropriates wastewater from another's ditch or irrigation system runoff, the owner of the ditch or irrigation system is not obligated to maintain existing conditions, so as to supply the appropriation with wastewater at any time, or in any volume (666).

In summary, it is clear that the question of use and control of surface waters, be it "diffused," "waste," "seepage," or "developed," turns on the determination of whether or not such waters are tributary to a stream system. Consequently, in the majority of cases, appropriation by another, who is outside of the priority scheme on a particular stream, of surface water naturally flowing to the stream, will be greatly limited by the vested rights of the stream appropriators.

Even if the surface water is found not to be tributary to any stream, there still may be considerations of priority as established by such laws as Colorado's Livestock Water Tank Act (656). Although a landowner has some right to use surface water flowing over or arising on his land, once one analyzes the Colorado law and precedent pertaining to such water, the right is not as broad as it might initially appear.

Implications for Land Application Systems--

The law of surface waters in Colorado makes no distinction between the several different types of land application systems. The case and statutory law is primarily concerned with the right of one landowner to control and utilize the flow of surface water across his lands and those contiguous thereto. Complicating Colorado law (as well as the law of several other Western States) is the presumption that all surface water is tributary to a stream. With that in mind, it is important that the operators of a land application system take note of the surrounding topography so as not to interfere with stream appropriators depending on local surface water runoff to maintain the stream flow. Furthermore, steps must be taken to avoid excessive pollution of surface water flows tributary to local streams so as to avoid damage liability to local stream appropriators.

If, on the other hand, precautions are taken to retain trace pollutants within the perimeter of the site after application of the wastewater, surface waters, such as precipitation, will also necessarily be retained at the site, and will not flow across adjoining lands as they had prior to institution of that land application system. Given the presumption that all surface flows are tributary to stream systems, it will be difficult to establish otherwise and, thus, allow for impoundment of that water. Only if the surface waters are established not to be tributary to a stream system, may the water be impounded without risk of liability.

Thus, the major factor distinguishing Colorado (and western) law from eastern law is the presumption of the tributary nature of the surface water in question. This presumption, and the overcoming of it, will limit the extent to which any land application system will be allowed to interrupt or impound the flow of surface water coursing across the land chosen as the application site.

Although Colorado has no explicit statement directed to the pollution of surface waters, the mere fact that they are usually considered to be tributary flows implies that any pollution thereof is actionable by appropriators on any particular stream affected. Thus, a land application system is met with two barriers not present in riparian states in trying to establish a site upon which to operate. First, the system cannot impound waters that are tributary to any stream so as to avoid the flow of pollutants into that stream, if the stream has previously established diversion works and the impoundment will affect their duties. Second, even if the surface water is proven to be nontributary, there is still the possibility that that water is already being used by an appropriator, and consequently, appropriation of that water by the land application system is actionable by the prior appropriator injured thereby.

Moreover, if the surface water finds its way into an underground stream or adversely affects underground waters (which are also presumptively tributary), the possibility exists that the on-land application system will be liable both to appropriators utilizing groundwater sources affected or to surface stream users which are injured by the previously contaminated groundwater finding its way into the natural stream upon which they have established their diversion works.

Given these basic principles, the recommendations contained in Volume I of this report for land application systems as they relate to surface waters in appropriation theory states apply in Colorado. In addition, the Colorado Department of Health has developed separate guidelines for both large wastewater application systems (667) and small individual units (668).

The guidelines applicable to small individual land application units require that the distance between discharge and inhabited premises be sufficient to prevent the development of a nuisance condition (669) and the distribution areas be sufficient to absorb the total effluent flow (670). In addition, the guidelines require that all discharges be contained within the system's perimeter (669). This should be done even if it involves also containing diffused surface water, such as rainfall, within the system's perimeter. Containing this water can be done without risk of liability if the surface water is a nontributary flow and not already subject to appropriation in whole or in part. According to the Colorado law on the use of surface water, an upper landowner can redirect the flow of such water into ditches or ponds, if the redirection is handled with due care and does not injure adjoining landowners or other appropriations.

## Law of Groundwater

### Description--

The general distinction between percolating waters and underground streams, which dominates the law of groundwaters in a majority of the appropriation doctrine jurisdictions, is immaterial in Colorado water law (671). What is important is the distinction between tributary and nontributary groundwater flows. As in the case with surface waters, this characterization of groundwater leads to a presumption that all such water within the watershed of a stream system is tributary to that stream and subject to the appropriation rights of the water users on the stream:

> [T]here is a presumption that underground water is tributary to a natural stream in the watershed in which it is found and that he who asserts that underground water is not tributary to a stream has the burden of establishing that fact. In the absence of such evidence the presumption prevails. (672)

> Ground water, in Colorado's century of water use development is not to be regarded as property of the public, except in such instances where it is tributary to a natural stream. ...but that presumption is *prima facie* only, and is therefore rebuttable. (673)

The law governing underground water in Colorado is predominately statutory; the Water Right Determination and Administration Act of 1969 (674) establishes the legal framework in which all types of waters are administered. The Act sets out in detail certain considerations pertinent to tributary groundwaters. Most importantly, all surface and groundwaters in the state that are tributary to a natural stream are subject to appropriation and use. Included among such waters is the underflow of natural streams, which Colorado law recognizes as part of the stream itself and not a separate water flow in which rights can be obtained outside of the appropriation arrangement of the surface flow itself (675).

Pursuant to the Act of 1969, an appropriator of water from an underground stream or a surface stream can supply his additional water needs from a well, even if the well taps into a tributary of the stream upon an alternate point of diversion. However, the right of a senior appropriator to satisfy his needs at the expense of a junior appropriator is limited by Colorado Statutes:

> (2) *Each division engineer shall order the total or partial discontinuance of any diversion in his division to the extent the water being diverted is not necessary for application to a beneficial use;* and he shall also order the total or partial discontinuance of any diversion in his division to the extent the water being diverted is required by persons entitled to use water under water rights having senior priorities, but no such discontinuance shall be ordered unless the diversion is causing or will cause material injury to such water rights having senior priorities.... (Emphasis added) (676)

This subsection of the statutes requires the senior appropriator to utilize all available alternatives to supply his water use needs, before a junior appropriator will be required to sacrifice his rights to quantity. Obviously, the senior's use and the points of diversion from which he draws his water will be governed by the water law principles discussed in regard to natural watercourses.

The statutory provision governing nontributary flows of groundwater (such as designated groundwater) is:

> (6) 'Designated ground water' means that ground water which in its natural course would not be available to and required for the fulfillment of decreed surface rights, or ground water in areas not adjacent to a continuously flowing natural stream wherein ground water withdrawals have constituted the principal water usage for at least fifteen years preceding the date of the first hearing on the proposed designation of the basin and which in both cases is within the geographic

boundaries of a designated ground water basin. (677)

Colorado's law relating to nontributary groundwaters was changed by the Ground Water Management Act (678). Section 37-90-102 of the 1973 Revised Statutes permitted these waters to be appropriated for the first time:

> It is hereby declared that the traditional policy of the state of Colorado, requiring the water resources of this state to be devoted to beneficial use in reasonable amounts through appropriation, is affirmed with respect to the designated ground waters of this state, as said waters are defined in section 37-90-103(6). While the doctrine of prior appropriation is recognized, such doctrine should be modified to permit the full ecomonic development of designated ground water resources. Prior appropriations of ground water should be protected and reasonable ground water pumping levels maintained, but not to include the maintenance of historical water levels. All designated ground waters in this state are therefore declared to be subject to appropriation in the manner defined in this article.

The Ground Water Management Act establishes a permit system and a Ground Water Commission made up of 12 members to review the applications for these permits to draw on designated waters (679). Detailed analysis of the impact of the Act is beyond the scope of this report. However, in the final analysis, the right of users of designated groundwaters are controlled by the principles of the prior appropriation doctrine enumerated therein.

### Implications for Land Application Systems--

Colorado is one of the majority of Western States that applies its appropriation doctrine to all underground waters. Consequently, the legal implications are different than those pertaining to groundwaters in riparian states. They are, instead, comparable to the natural watercourse legal structure in appropriation states.

The Colorado groundwater law does not distinguish between the different types of land application systems. Instead, the law is primarily concerned with whether or not the groundwater in question is tributary to a natural stream, or subject to appropriation as a nontributary water source. Colorado presumes that all groundwaters are tributary to natural watercourses. This presumption raises a number of problems. First, claims or priority will have to be considered not only in respect to local surface stream appropriators to which the underground water is tributary, but, even in the case of nontributary groundwaters.

Second, if the groundwater becomes polluted, groundwater appropriators or surface stream water users will have a cause of action against the land application system causing the pollution.

Third, the burden of proof in trying to establish the fact that a particular underground water source is not a tributary of some local stream, is met only by "clear and convincing" evidence. The difficulty of meeting this burden obviously depends on topography, soil conditions, subterranean rock structures, and the proximity of other natural watercourses, among other factors.

Certain precautions to minimize liability can be taken provided, of course, that the initial stages of establishing an appropriation for land application have been passed successfully. These precautions have been discussed in Volume I of this report. In addition to the general recommendations noted therein, it should also be noted that in operating a land application system, the Colorado Department of Health guidelines concerned with small individual systems require that the effluent be contained within the boundaries of the premises (669).

Even if all precautions are taken, it is still possible, of course, that trace pollutants might seep into underground water supplies after application. If that happens, and if those pollutants find their way into nearby streams, the land application system could be held liable for provable damages. Although the "beneficial use" concept would temper the extent of liability, it does not preclude the fact of liability. Interference with an established appropriative right is actionable and there appears to be no consideration that would allow a party to escape liability therefor.

## Summary

The Colorado Department of Health has recently developed guidelines concerned with large wastewater application systems (over 2,000 gallons per day) (667) and small individual systems (under 2,000 gallons per day) (668). Both of these guidelines are more rudimentary than those of some other states, but are stringent in several respects. This stringency may tend to discourage the creation of land application systems in Colorado.

One or the other of the Colorado guidelines specify standards for effluent disinfection, BOD, COD, fecal coliform density, suspended matters, nutrients, and trace elements (680). None of these standards are overly stringent. More troublesome, however, are some of the general conditions stated in one or the other guidelines. For example, the guidelines concerned with small individual systems require that the effluent be contained within the boundaries of the premises, and that the discharge be a sufficient distance from inhabited property as to prevent development of a nuisance condition (681). A more specific standard for a buffer zone might be desirable because it would be more predictable; however, the use of the legal term "nuisance" indicates that minor harm or irritation would not fall within the scope of this prohibition.

Another provision in the small application system guidelines requires that effluent be distributed over an area sufficient to absorb the total effluent flow and that the effluent shall not be applied to edible crops (682). A provision prohibiting the use of sludge on crops eaten raw by humans is in the guidelines concerned with large scale application systems (683). These statements will cause difficulty. The flat prohibition against use of effluent on edible crops in the small scale system guidelines (no distinction is made on whether the edible crops are for human consumption or not), of course, eliminates a wide variety of possible uses of effluent. Although this prohibition is not compelled by the underlying Colorado water law, nowhere in the guidelines is there any exception to or qualification of this prohibition.

Moreover, even within the restricted areas within which effluent may be used (such as for forage crops) under the small scale system guidelines, the requirement regarding "an area sufficient to absorb the total effluent flow" may raise additional problems. What is meant by the term "total effluent flow?" If it means the applied effluent, the restriction is not unreasonable, particularly as applied to a system such as an overland-flow system. On the other hand, if the statement prohibits any dispersal of pollutants as part of the effluent flow, then it may establish a standard difficult if not impossible to meet. Possibly the guidelines could be interpreted to restrict flow across adjoining lands or into waterways, and not dispersal of trace contaminants into the earth, since the latter is not really a "flow." If this is the case, then these guidelines merely reiterate the previous requirement that effluent be kept within the boundaries of the premises, and is not unduly burdensome. On the other hand, it would seem that the guidelines must have been intended to do more than restate the immediately preceding section of the guidelines.

In the absence of administration interpretation and application of both the Colorado Department of Health guidelines, they are restrictive and vague in several important respects. While these guidelines are not compelled by Colorado water law, the fact remains that Colorado's water law is not, on the whole, as favorable to land application systems as the water law of several other states.

For example, the surface water law of Colorado is less favorable because of the narrow scope of the surface water definition, and the possibility of there being appropriative rights in surface waters. Unlike the situation existing in most other states, a land application system cannot resolve any surface water issues by the simple expedient of detaining all surface waters at the application site. In some topographical situations this will be possible, but in others it will be impossible without either interfering with pre-existing rights in surface waters or running afoul of the two Colorado Department of Health guidelines.

With this reservation, operation of land application systems will be possible within the relatively limited area presently permitted by both the guidelines. The overall posture of the Colorado law, however, while not totally unfavorable, is relatively less favorable than the legal context that exists in most other states discussed in these reports.

## KANSAS

### Legal Background

Kansas does not have any regulations pertaining to land application of wastewater. The Kansas Department of Health and Environment encourages such irrigation where it is shown to be cost effective; however, disinfection is required prior to irrigation (684).

What makes Kansas unique is that it is the only state west of the Mississippi to have applied exclusively the riparian doctrine until relatively recent times. Initially, the Kansas Supreme Court even applied the "natural flow" branch of the riparian doctrine. In *Shamleffer v. Council Grove Peerless Mill Co.* (685), it was said that each riparian owner "...is entitled to a stream of water flowing through his land, without diminution or alteration" (686). However, by 1881, the reasonable use doctrine became the law governing water rights in Kansas. In *City of Emporia v. Soden* (687), it was said that "...each riparian owner may, without subjecting himself to liability to any lower riparian owner, use of the water whatever is needed for his own domestic purposes and the watering of his stock" (688). The reasonable use doctrine was constantly (if not consistently) applied until the Kansas Legislature adopted the Water Appropriation Act of 1945 (689). During this period, Kansas was the only one of the seventeen Western States not applying the prior appropriation doctrine.

Several times prior to 1945, application of the prior appropriation doctrine was resisted by the Kansas Supreme Court in spite of piecemeal attempts at legislative implementation. For example, an 1886 Act provided that landowners could acquire appropriation rights by recording notices with the county register of deeds (690). A 1917 Act supplemented this procedure by allowing the Kansas Water Commission to grant such rights upon appropriate application (691) and in 1927 this duty was transferred to the Division of Water Resources in the State Board of Agriculture (692).

In 1936, the Kansas Supreme Court said all of the above was to no avail whenever the appropriation rights would operate as against landowners who acquired their lands by grant from the Federal government or whose predecessors in interest had so acquired the land (and thus their common law water rights) before the statutes took effect (693). To allow the appropriation doctrine to affect those rights would be a taking of property rights recognized at law and, therefore, an unconstitutional taking of property.

After yet another legislative attempt to correct this situation (694), another supreme court decision rendered this legislation, also, completely ineffective. In *State ex. rel. Peterson v. State Board of Agriculture* (695), it was held that the common law right to absolute ownership of all groundwaters was still the Kansas law and that the Kansas Division of Water Resources was without power to allocate or distribute the same without compensating the owner.

Faced with such judicial intransigence, the executive and legislative branches decided to wipe the spotted slate of the appropriation doctrine clean and start writing a new comprehensive statutory plan which would apply the appropriation doctrine across the board to all waters, regardless of their classifications in common law terms. The result was the Water Appropriation Act of 1945 (689).

## Water Appropriation Act of 1945

Following the *Peterson* decision (695), the Governor of Kansas appointed a committee to study the water law of the state and propose changes. The committee concluded that:

> '...unused water cannot wisely be held in perpetuity for a common-law owner who may never have use for it, without resulting in underdevelopment permitting the water to flow out of the state and on toward the ocean, as an economic waste and loss of a valuable natural resource. It (the committee) believes two things are needed, (1) to establish the right of appropriation under the rule of priority of right, and (2) to establish adequate administrative control over the appropriation of water to prevent overdevelopment of any source of supply with resulting injury to established uses.' (696)

A statute embodying the committee's desires was drafted, recommended to the legislature by the governor, and passed into law as the Water Appropriation Act of 1945 (689). This legislation was patterned after earlier Oregon legislation, in that it limited vested rights of riparian claimants to actual beneficial use of water at the time of the 1945 passage, or within a reasonable time thereafter in the case of works then under construction. The validity of this statute was subsequently sustained by the Kansas Supreme Court (697).

The Water Appropriation Act of 1945, as later amended (689), is the primary source of the substantive law of water rights for all categories of water within the state of Kansas at present.

All water in the state is subject to state control and regulation (698). Subject to vested rights, "...all waters ... may be appropriated for beneficial use" (699). A "vested right" is the right to continue using water for any beneficial use when the water was being so used prior to the adoption of the Water Appropriation Act (700). Appropriation rights can be acquired in two ways: (1) by using water for domestic purposes (701); and (2) by obtaining the approval of the chief engineer (702). The chief engineer means the chief engineer of the Division of Water Resources in the Kansas State Board of Agriculture (703).

The chief engineer has broad discretionary powers to administer and enforce the laws of the state (704) and to adopt and enforce rules, regulations, and standards (705). All applications for appropriation rights are made to the chief engineer, who approves or disapproves them (702).

If the application for appropriation rights is approved, an appropriator gets the right to use a "...specific quantity of water ... [subject to] reasonable raising or lowering of the static water level and ... reasonable increase or decrease of the streamflow" (706). He is also allowed to enjoin any later appropriators who interfere with his beneficial use (707).

In general, Kansas' water law structure is now similar to those other appropriation states which recognize only the right of appropriation (although Kansas still protects riparian rights predating 1945). Since all waters are subject to appropriation, possible distinctions between types of waters which may prove troublesome in other Western States are irrelevant in Kansas. Unlike other Western States, Kansas is unique in that its water law, in effect, dates from 1945, and is therefore not entangled with historical considerations involving either the riparian doctrine or the original settling of the West.

Basic water law in Kansas is favorable to the establishment of on-land application systems. All waters--natural watercourses, surface waters, and groundwater--may be appropriated for beneficial uses under the Water Appropriation Act of 1945 (689). Water used in land application systems is considered a beneficial use. Operators of systems would, however, have to obtain approval of the State Board of Agriculture to appropriate water. Retaining surface waters on one's land would, for example, be considered appropriation of that water.

## TEXAS

Texas does not have any formally adopted administrative regulations pertaining directly to land disposal of treated effluent; however, the Texas Department of Health Resources and Texas Water Quality Board (now Texas Water Development Board) have jointly issued guidelines, "Design Criteria for Sewerage Systems," (708) dealing with the subject. Sewage effluent may be utilized for irrigation purposes under the guidelines when it can be shown that the practice will not alter the uses of existing groundwaters or detrimentally affect the surface waters of the state (709).

Each application for a permit to operate a land disposal project is considered on an individual basis (710). Applications for projects must be accompanied by maps, diagrams, plans, and specifications that discuss the site's location, ownership and uses of land adjoining the site, geologic formations of the site, groundwater hydrology of the site, effluent quality, and agricultural practices to be carried out at the site (711).

### Texas Water Code of 1971

The Texas Water Code of 1971 (712), particularly that portion of it known as the Texas Water Quality Act (713), maintains a tight statutory control over discharges into "waters" of the state. Any municipality or other political subdivision of the state proposing a land treatment system will be required by the Texas Water Commission (formerly a function of the Texas Water Quality Board) to obtain a permit prior to operating the facility (714). As long as the system operates within the confines of the permit (which is subject to revision by the Texas Water Commission), the state may not obtain injunctive relief for operation of the system (715). The permit, as long as it is being obeyed, constitutes a limited entitlement or license to pollute.

It is possible that the property owner may also be required under the

Water Code to obtain a permit if the land is improved for purposes of facilitating disposal of the effluent. The Water Code is written in very broad language. For example, section 26.001, which includes the definitions, provides:

> (5) 'Water' or 'water in the state' means groundwater, percolating or otherwise, lakes, bays, ponds, impounding reservoirs, springs, rivers, streams, creeks, estuaries, marshes, inlets, canals, the Gulf of Mexico inside the territorial limits of the state, and *all other bodies of surface water,* natural or *artificial,* inland or coastal, fresh or salt, navigable or nonnavigable, and including the beds and banks of all watercourses and bodies of surface water, that are wholly or partially inside or bordering the state or inside the jurisdiction of the state. (Emphasis added) (716)
>
> (8) 'Municipal waste' means waterborne liquid, gaseous or solid substances that result from any *discharge* from a publicly owned sewer system, treatment facility, or *disposal system.* (Emphasis added) (717)
>
> (17) 'Disposal system' means *any system* for disposing of waste, including sewer systems and treatment facilities. (Emphasis added) (718)
>
> (20) 'To discharge' includes to deposit, conduct, drain, emit, throw, run, allow to seep, or otherwise release or dispose of, or to allow, permit, or suffer any of these acts or omissions. (719)

The irrigation facilities would clearly be a "disposal system" under the broad definition of section 26.001(17) of the Water Code. Section 26.001(8) seeks to transform the effluent being "discharged" into any "water" or "water of the state" into a "municipal waste," but will not do so unless the system is a "publicly owned" one. Unless the property is owned by a public body, such as a municipality, in which case it must obtain a permit, a privately-owned system clearly is not "publicly owned" and so his waste is not a "municipal waste," unless the character of the waste is presumed to be unchanged through the "disposal system" to the point of its discharge into a groundwater aquifer (which is a "water of the state"), or into a watercourse (which is a "water of the state"), or into a holding basin of some sort constructed by the system operator to prevent runoff and pollution of a watercourse--in which case, the holding pond itself may be a "water of the state." Remember, section 26.001(5) of the Water Code includes "...all other bodies of surface water [including] ... artificial...."

"Waste" is defined by section 26.001(6) of the Water Code to include "...sewage, industrial waste, municipal waste, recreational waste, agricultural waste...." But the Water Code, in section 26.001(10) specifically excludes, in defining "agricultural waste," any "...tail water or runoff water from irrigation or rainwater runoff from cultivated or uncultivated range land, pasture land, and farmland."

Thus, the Water Code is ambiguous, since the term "irrigation" is nowhere defined. There is a good likelihood that a court might find that the "waste" going through a private disposal system is still a "municipal waste" and not "irrigation water" as contemplated under the Water Code. No such case interpreting this aspect of the law is reported in the literature.

In view of the ambiguity of the Water Code in this area, it is advisable for any potential system operator to obtain a permit from the Texas Water Commission until such time as it promulgates a rule interpreting this problem area or until a Texas court makes the interpretation. It may even be more desirable to obtain a permit from the state in some instances, since failure to do so allows the county to regulate the system (720). Section 26.031 of the Water Code provides for "private sewage facilities," which are defined as "...all other facilities, systems, and methods used for the disposal of sewage *other than disposal systems operated under a permit issued by the commission*" (Emphasis added). So a system is either nonprivate, in which case a permit is needed, or it is private, in which case no permit is needed, but the county can enjoin its operation. Issuance of a permit by the state suspends the county's right to enjoin operation of the facility.

### Law of Natural Watercourses

Texas uses both the prior appropriation and the riparian doctrines. This dual system is within the scope of the "California doctrine" (721). Unlike in California, however, where the riparian right is observed more in theory than in fact, in Texas, riparian rights are frequently of importance. Texas employs the riparian doctrine in the eastern part of the state where the terrain and custom more nearly resemble that of states east of the Mississippi River. In the arid prairie sections of West Texas, the prior appropriation doctrine is usually controlling. Thus, in a given fact situation, Texas law could resemble either that of the typical appropriation theory states or that of its riparian neighbors to the east.

### Law of Surface Waters

Texas applies the "civil law" rule, which means that a person who interferes with the natural flow of surface waters so as to invade another's interests in the use and enjoyment of his land is subject to liability to the other (722). This broad rule will allow recovery for any damages caused another by changes to the natural flow pattern of surface waters on a parcel of Texas real property (723). The principal theories of recovery for pollution are nuisance or negligence.

Negligence is the breach of a legal duty of care owed to another with consequent damage, but without intent. In the case of the operator of a land treatment system, if such operator operates the system carelessly so as to allow rainwater to sweep away contaminants from it and deposit them on the land of his neighbor, resulting in damage to the neighbor's property or person, the negligent operator is liable to the injured neighbor for damages. Before an action on a theory of negligence may be successfully pursued, it must allege:

1. An interest in the court will protect--an interest in land will do;
2. A duty on the part of the operator to operate the land treatment system reasonably so as not to harm the plaintiff;
3. Breach of the duty owned by unreasonable operation of the systems; and
4. Resulting harm to plaintiff flowing directly from the negligence of the person operating the land treatment system.

Allegation of these elements makes out a *prima facie* case of negligence and the plaintiff, if successful in his proof, can recover damages as well as an injunction to stop the continuous pollution of his property. Although earlier cases had suggested that Texas would adopt a strict liability rule in pollution cases, the Texas Supreme Court in a 1936 decision, *Turner v. Big Lake Oil Co.* (724), held that a plaintiff must prove negligence before he can recover. If the plaintiff can show that the system is operating outside of its permit from the Texas Water Commission, he can show negligence *per se,* and proof of negligence on the part of the operator is then unnecessary. This makes his case much easier and his likelihood of recovery in court much greater.

Lawsuits by adjoining property owners usually arise when a system is either improperly designed, constructed, or operated. Preventive measures include good design, adequate supervision of construction by a competent engineer, testing the system prior to placing it in service, and testing the system by competently trained operators after the facility is in operation. Texas assures much of this by requiring approval of plans and specification for such projects by the State Department of Health Resources and Water Commission (711).

Nuisance differs from negligence in the important respect that reasonable care is not a defense to a charge of nuisance. Under negligence theory, if the defendant operator can show that he has operated his system according to the standard care imposed by law, he will not be held liable for negligence. On the contrary, reasonable care is irrelevant in a nuisance action. The plaintiff must only show that the defendant is causing or threatening to cause damage to an interest that the court will protect. Traditionally, Texas courts have protected only economic interests, as opposed to aesthetic or recreational interests (725).

In cases where a plaintiff has suffered special injury caused by an otherwise lawful business operation, he may seek to enjoin the nuisance. In deciding whether to issue an injunction, the Texas court will balance the equities, weighing the damage to the plaintiff against the value to the community in maintaining the defendant's nuisance. The defendant will be permitted to prove the value of his pollution by offering evidence that abatement of the nuisance would cause detriment to the local community in terms of jobs, services, or goods. Preventive measures to avoid nuisance actions include the same design and operative care recommended under negligence. This will not guarantee freedom from lawsuits under a nuisance theory, but will build a better base for establishing inconsequential harm to the plaintiff, which in turn helps the defendant in the court's balancing the equities to determine if an injunction should be issued. Attack through a nuisance legal theory is a calculated risk that is run by any public body contemplating installation of a public sewage treatment facility. Proper design and operation will go a long way toward preventing the kind of ongoing offense characteristic of nuisance, thus relegating lawsuits to the occasional levee break or surcharge of effluent that might be traceable to negligence--an easier theory to defend against.

### Law of Groundwater

Texas follows the English rule as to right to groundwater, which is also referred to in Texas as percolating water. Simply stated, that rule provides that an owner of land has a legal right to take all the water he can capture under his land that is needed by him for his use, even though the use has no connection with the use of the land as land and requires the removal of the water from the premises where the well is located (726).

If a particular case involved an adjacent property owner who drained his low-lying land into an underground aquifer through a permeable soil and sub-soil, and a nearby land treatment system using the rapid infiltration method elevated the water table and ruined his drainage, it is unclear whether there would be liability in Texas. The English rule concerns itself with withdrawal of water from the ground and not introduction of water into the ground. The apparent reason that Texas has not experienced this problem is that a rapid infiltration system recharges the groundwater table. Because the groundwater table in Texas is usually too low, there are usually very few problems with its elevation. Even if an elevation problem did exist the injured party may not have a cause of action.

However, looking at it another way a Texas court, in the absence of applicable groundwater law, might refer by analogy to its law of surface water, in which case liability could be based on nuisance or negligence. In such a case, remedies available to the injured party could include injunctive relief, which might stop the project, and/or damages for the injury. The appropriate preventive measures to be taken to avoid the occurrence of such a problem as this is to study the surrounding area to determine if such a problem existed prior to installing the treatment system and, if it did, provide some other means of application that does not result in an elevated groundwater table.

In a case involving pollution of groundwater supplies, it must first be noted that the Texas Water Quality Act (713) is drawn broadly enough to include groundwater as a "water of the state," and therefore an illegal discharge into an aquifer is prohibited by the Act. However, if the land treatment system is operating within its permit, the discharge is not unlawful, and so the state may take no action to enjoin. The Texas Water

Commission, however, could simply change the conditions of the permit such that the polluter must comply or be then subject to injunction. In effect there may be a public remedy.

A more important question is whether other users may enjoin the operation of such a facility, as a rapid infiltration land treatment system, where recharge of the aquifer results in a polluted water supply for them?

The legal theory upon which private actions against pollution of groundwater may proceed are not those connected with the law of percolating water, discussed previously. Instead, the law of nuisance and negligence must be applied. While courts have overwhelmingly preferred nuisance law to diversion allocation rules in groundwater pollution cases, the preference nor nuisance law over negligence law is slight (727). One explanation for a nuisance preference in groundwater cases might be that this approach allows for liability without any finding of culpability. This last requirement is not too onerous in surface water cases where the polluter can reasonably assess the consequences of his act, but may be in subsurface waters where it is difficult to predict results with any degree of accuracy. Use of negligence law allows courts to take into account the ability of each particular polluter to predict the consequences of his activity.

Texas experience in groundwater pollution has been relegated primarily to private nuisances arising out of the so called "cemetery cases," wherein injunctions are issued to forestall installation of cemeteries on the theory that they would pollute wells in the area. The most recent case simply did not specify a theory upon which to dispose of a case in which a proposed sanitary landfill would allegedly pollute underground water sand (728).

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# GLOSSARY

appropriation: The doctrine applied in the 17 contiguous Western States and Alaska, under which one's right to use water is not based on onwership of land on the bank of a watercourse, but on a prior appropriation of the water. To constitute a valid appropriation there must be an intent to apply water to some beneficial use, a diversion of the water from the natural channel, and an actual application of the water within a reasonable time to a beneficial purpose.

diffused surface water: In most states, this term is used interchangeably with "surface water" and has no independent meaning. The cases of a few states use the term "surface water" to encompass all waters on the surface of the land, including waters in surface watercourses. In these states the term "diffused surface water" carries the meaning ascribed to "surface water."

groundwater: Water beneath the surface of the earth that does not flow in a well-defined channel and is not confined to a well-defined bed.

natural flow: A branch of the riparian theory of rights to water in natural watercourses. Under the natural flow theory, a riparian landowner has the right to the water of the watercourse in its natural condition, undiminished in quantity or quality, except for only "natural" uses, such as domestic by upstream riparians. The riparian landowner, in turn, may only make "natural" uses of the water, in order to preserve it for the riparians located still farther downstream.

natural watercourse: In addition to the definition specified for a watercourse, a natural watercourse is a watercourse formed by the natural flow of water as determined by the conformation of the surrounding country, as distinguished from an "artificial" watercourse formed by the work of man, such as a ditch or canal. Many states, however, specify that artificial waterways can acquire the status of natural watercourses after the passage of several years, if there has been reliance by the affected parties on the flow of the water.

percolating water: In most states this term is used interchangeably with "groundwater" and has no independent meaning. A few states, especially in the West, use the term "groundwater" to include all water beneath the surface of the land, including water in underground watercourses. In these states, "percolating water" carries the meaning ascribed to "groundwater."

reasonable use: A branch of the riparian theory of rights to water in natural watercourses. Under the reasonable use theory, a riparian landowner has the right to make reasonable beneficial use of the water. This may include uses beyond "natural" uses, such as irrigation or manufacture, but this right is subject to the right of other riparians, both upstream and downstream, to also make reasonable beneficial use of the water.

riparian rights: The rights of the owners of land on the banks of watercourses to use the water of those watercourses. These rights exist in the 31 Eastern States which follow the riparian doctrine. Generally, riparian rights include the use of the water for "natural" purposes, such as bathing and domestic use, and for some "artificial" purposes, such as irrigation, watering of livestock, and manufacture. The scope of the permitted "artificial" purposes will depend, in a large part, on whether the particular state applies the strict "natural flow" or more liberal "reasonable use" theory of riparian rights.

surface water: Water on the surface of the land that does not flow in a well-defined channel and is not contained in a well-defined basin. Such water ordinarily results from rainfall and melting snow as it spreads over the earth's surface, and retains its character as surface water until it reaches a watercourse or seeps into the ground.

watercourse: A body of water which flows in a known and defined channel located either on the surface of the earth or beneath the surface. The general category includes both lakes and streams that meet the frequently stated criteria of having a definite course or channel, a substantial current, a definite source of supply, and an outlet into another body of water.